ADARSH INSTITUTE OF TECHNOLOGY AND RESEARCH CENTRE ,VITA

MSBTE- 0991

FIVTH SEMESTER
(Year: 2023-24)

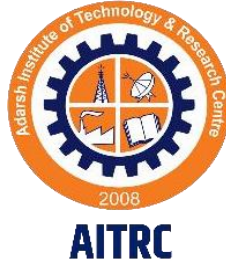## Micro Project

Operating System (22516)

Title of the Project: Create a report depicting features of different types Of operating system.

Branch: Computer Technology (CM5I)

Members of the Group:

Sr. No.	Name of Student	Roll No.
01	Tanishka Suhas Pandharpatte	3113
02	Shubham Dhondiram Mahadik	3114
03	Harsh Mahesh Phase	3115
04	Geetanjli Jotiram Deshmukh	3116

Loknete Hon. HanmantraoPatil Charitable Trust's
Adarsh Institute of Technology & Research Centre Vita,

CERTIFICATE

This is to certify that the micro project report entitled
"Create a report depicting features of different types Of operating system."
Submitted by

Sr. No.	Name of Student	Roll No.
01	Tanishka Suhas Pandharpatte	3113
02	Shubham Dhondiram Mahadik	3114
03	Harsh Mahesh Phase	3115
04	Geetanjli Jotiram Deshmukh	3116

For Fivth Semester of Diploma in Computer Technology of course Operating System(22516)
for academic year 2023-24 as per MSBTE, Mumbai curriculum of 'I' scheme.

DIPLOMA OFENGINEERING
(Computer Technology)

SUBMITTED TO
MAHARASHTRA STATE BOARD OF TECHNICAL EDUCATION MUMBAI
ACADEMIC YEAR 2023-24

Project Guide	**H.O.D.**	**Principal**
Prof.A.A.Vankudre	**Prof.A.A.Vankudre**	**Dr.P.S.Patil**

MICRO PROJECT
Progress Report / Weekly Report

Title of the Project: Create a report depicting features of different types Of operating system.

Course: OSY(22516)   **Program: Computer Technology (CM5I)**

Week No	Date	Duration in Hrs.	Work / Activity Performed	Sign of the Faculty
1		2hour	Knowing the basic	
2		1hour	Decide Aim	
3		2hour	Collect the Data	
4		2hour	Prepare project proposal	
5		1hour	Search Literature review	
6		1hour	Analysis of Data	
7		1hour	Discussion over preparing	
8		2hour	Correction in Booklets	
9		2hour	Report writing	
10		1hour	Checking report	
11		1hour	Correction report write	
12		1hour	Rechecking report	
13		1hour	Finalizing report writing	
14		1hour	Final submission	
15		1hour	Oral presentation of micro project	

Teacher Evaluation Sheet for Micro Project

Course Title and Code: - Operating System(22516)
Title of the Project: Create a report depicting features of different types Of operating system.

Group No: -4
COs addressed by the Micro Project:

CO a:	Use operating system tools to perform various functions.
CO b:	-
CO c:	-
CO d:	-
CO e:	-
CO f:	-

Marks:-

Roll No.	Name Of Student	Marks for Group Work (06)	Marks obtained by the individual based on viva (04)	Total Marks (10)
3113	Tanishka Suhas Pandharpatte			
3114	Shubham Dhondiram Mahadik			
3115	Harsh Mahesh Phase			
3116	Geetanjli Jotiram Deshmukh			

Name and designation of Faculty Member: **Prof.A.A.Vankudre**

Lecturer (Computer Technology Department)

Signature: _____

ACKNOWLEDGEMENT

I express my sincere gratitude to **Prof.A.A.Vankudre .**, Department of **Computer Technology**, for **his/**her stimulating guidance, continuous encouragement and supervision throughout the course of present work.

I would like to place on record my deep sense of gratitude to **Prof.A.A.Vankudre**
HOD- Department of **Computer Technology**, for his generous guidance, help and useful suggestions.

I am extremely thankful to Principal **Dr.P.S.Patil** for this motivation and providing me infrastructural facilities to work in, without which this work would not have been possible.

I would like to express my gratitude to all my colleagues for their support, co-operation and fruitful discussions on diverse seminar topics and technical help.

Name of Student	Sign
Tanishka Suhas Pandharpatte	
Shubham Dhondiram Mahadik	
Harsh Mahesh Phase	
Geetanjli Jotiram Deshmukh	

Index

Sr. No.	Content	Page No.
1.0	Rationale	
2.0	Course Outcomes Addressed	
3.0	Literature Review	
4.0	Actual Methodology Followed	
5.0	Actual Resources Used	
6.0	Outputs of the Micro Project	
7.0	Skill Developed / learning out of this Micro Project	
8.0	Applications of this Micro Project	
9.0	Area of Future Improvement	

Title of Micro-Project: Create a report depicting features of different types of Operating system.

1.0 Brief Introduction

An operating system (OS) is a crucial software component that acts as an intermediary between the hardware and software of a computer system. It manages hardware resources, provides a user interface, and facilitates the execution of applications. Operating systems come in various types, each designed for specific purposes and with unique features. This report aims to provide an overview of different types of operating systems, their objectives, key features, and the rationale behind studying them.

2.0 Aim of the Micro-Project

- The primary aim of this report is to explore and understand various types of operating systems, including real-time, single-user, multi-user, and network operating systems. By analyzing their distinct characteristics, we aim to gain insights into the diverse requirements of modern computing environments.

3.0 Intended Course Outcomes

- ❖ Use operating system tools to perform various functions.

4.0 Literature Review

Review :

1. Real-Time Operating Systems (RTOS): Real-time operating systems are designed to process data as it arrives, making them critical for applications where timely execution is paramount. Examples include avionics systems, industrial automation, and medical devices. RTOSs, such as VxWorks and QNX, provide predictable and deterministic response times.

2. Single-User Operating Systems: Single-user operating systems are primarily designed for personal computing. They offer a user-friendly interface and focus on individual user needs. Microsoft Windows and macOS are prominent examples. They provide multitasking capabilities, a graphical user interface (GUI), and extensive software support.

3. Multi-User Operating Systems: Multi-user operating systems cater to shared computing environments where multiple users access the same system simultaneously. Unix-based operating systems, including Linux and FreeBSD, are prime examples. They provide robust security, resource allocation, and support for remote access.

4. Network Operating Systems (NOS): Network operating systems are optimized for managing networked resources, such as file servers and printers. They enable centralized control and resource sharing across a network. Novell NetWare and Windows Server are well-known NOSs, offering features like file and print services, user authentication, and directory services.

5.0 Proposed Methodology

1) Knowing the basics of the topic.

2) Decide aim of the project and collect the data.

3) Prepare project proposal.

4) Search Literature reviews.

5) Analysis of data.

6) Discussion over preparing and correction in booklet and report.

7) Converting the content of project in report writing.

8) Checking and correction in report writing.

9) Rechecking and finalizing report writing.

10) Final submission and oral presentation of micro project.

6.0 Resources Required

Sr. No.	Name of Resource/ Material	Specifications	Quantity	Remark
1	Computer System	i-5	1	
2	Microsoft Word	2010	1	
3	Internet	Any	1	

7.0 Action Plan

Sr. No.	Details of activity	Planned start date	Planned Finish date	Name of Responsible Team Members
1	Project Proposal			**All Members**
2	Data Collection & Analysis			**All Members**
3	Preparation of Prototype/ Model			**All Members**
4	Preparation of Report			**All Members**
5	Presentation & Submission			**All Members**

PART B - Micro- Project Proposal

Title of Micro-Project: Create a report depicting features of different types Of operating system.

1.0 Rationale:

The study of different types of operating systems is crucial for several reasons:

1.Understanding Diverse Computing Needs: Different computing environments have unique requirements, and selecting the appropriate operating system is essential for efficiency and reliability. By examining various OS types, we can identify the most suitable solution for specific scenarios.

2. Optimizing Resource Management: Operating systems play a significant role in managing hardware resources. Knowledge of different OS types helps in optimizing resource allocation, which is critical in shared and real-time systems.

3. Security and User Experience: Depending on the operating system, security features and user interfaces vary. Studying these aspects helps in making informed decisions about system security and usability.

4. Career Opportunities: Professionals in the field of information technology and computer science benefit from a comprehensive understanding of various operating systems. It enhances their employability and ability to work in diverse IT environments.

2.0 Course Outcomes Addressed

1. Use operating system tools to perform various functions.

3.0 Literature Review

Review:

   1. Real-Time Operating Systems (RTOS): Real-time operating systems are designed to process data as it arrives, making them critical for applications where timely execution is paramount. Examples include avionics systems, industrial automation, and medical devices. RTOSs, such as VxWorks and QNX, provide predictable and deterministic response times.

2. Single-User Operating Systems: Single-user operating systems are primarily designed for personal computing. They offer a user-friendly interface and focus on individual user needs. Microsoft Windows and macOS are prominent examples. They provide multitasking capabilities, a graphical user interface (GUI), and extensive software support.

3. Multi-User Operating Systems: Multi-user operating systems cater to shared computing environments where multiple users access the same system simultaneously. Unix-based operating systems, including Linux and FreeBSD, are prime examples. They provide robust security, resource allocation, and support for remote access.

4. Network Operating Systems (NOS): Network operating systems are optimized for managing networked resources, such as file servers and printers. They enable centralized control and resource sharing across a network. Novell NetWare and Windows Server are well-known NOSs, offering features like file and print services, user authentication, and directory services.

4.0 Actual Methodology Followed:

Member 1): Name: All Members.
Work: Finalize the group & project

Member 2): Name: Tanishka Suhas Pandharpatte

Work: Search information regarding project subject.

Member 3): Name: Shubham Dhondiram Mahadik

Work: Collect information and discuss with group members about proposal.

Prepare proposal and submit to the guide.

Member 4): Name: Harsh Mahesh Phase

Work: Analyze and finalize the information of the project report.

Member 5): Name: Tanishka Suhas Pandharpatte
Work: Write project report

Member 6): Geetanjli Jotiram Deshmukh

Work: Prepare rough sketch and final chart

5.0 Actual Resources Used

Sr. No.	Name of Resource/ Material	Specifications	Quantity	Remark
1	**Computer System**	i-5	1	
2	**Microsoft Word**	2010	1	
3	**Internet**	Any	1	

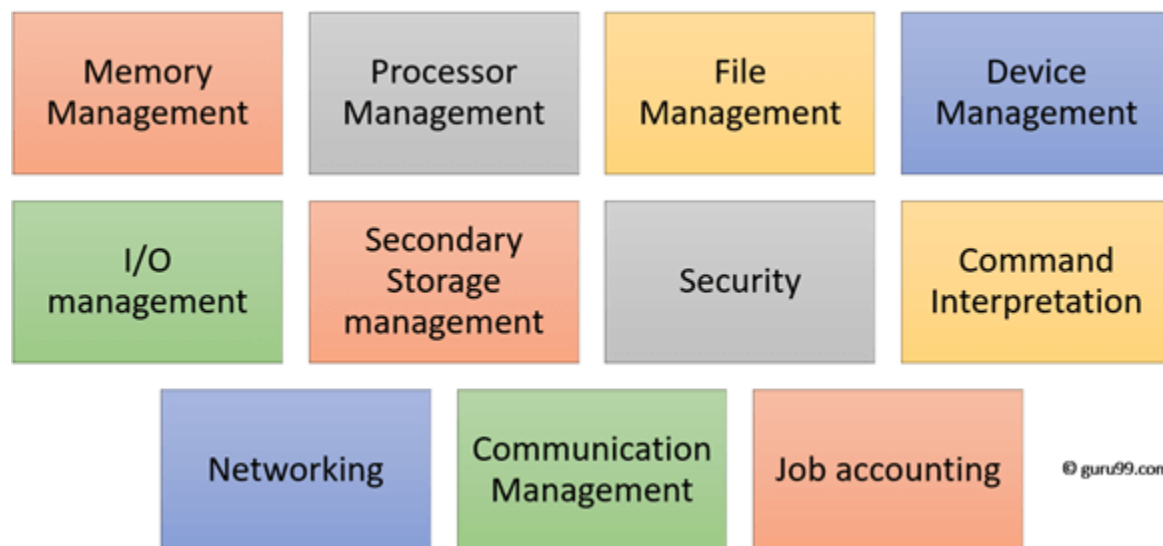**6.0** Outputs of Micro-Projects

What is an Operating System?

An **Operating System (OS)** is a software that acts as an interface between computer hardware components and the user. Every computer system must have atleast one operating system to run other programs. Applications like Browsers, MS Office, Notepad Games, etc., need some environment to run and perform its tasks.The OS helps you to communicate with the computer without knowing how to speak the computer's language. It is not possible for the user to use any computer or mobile device without having an operating system.

Functions of Operating System

Some typical operating system functions may include managing memory, files,processes, I/O system & devices, security, etc.

Below are the main functions of Operating System:

Memory Management	Processor Management	File Management	Device Management
I/O management	Secondary Storage management	Security	Command Interpretation
	Networking	Communication Management	Job accounting

© guru99.com

Functions of Operating System

In an operating system software performs each of the function:

1. **Process management**: Process management helps OS to create and delete processes. It also provides mechanisms for synchronization and communicationamong processes.

2. **Memory management:** Memory management module performs the task of allocation and de-allocation of memory space to programs in need of this resources.

3. **File management**: It manages all the file-related activities such as organizationstorage, retrieval, naming, sharing, and protection of files.

4. **Device Management**: Device management keeps tracks of all devices. Thismodule also responsible for this task is known as the I/O controller. It also performs the task of allocation and de-allocation of the devices.

5. **I/O System Management:** One of the main objects of any OS is to hide the peculiarities of that hardware devices from the user.

6. **Secondary-Storage Management**: Systems have several levels of storagewhich includes primary storage, secondary storage, and cache storage. Instructions and data must be stored in primary storage or cache so that a running program can reference it.

7. **Security**: Security module protects the data and information of a computersystem against malware threat and authorized access.

8. **Command interpretation**: This module is interpreting commands given by theand acting system resources to process those commands.

9. **Networking:** A distributed system is a group of processors which do not sharememory, hardware devices, or a clock. The processors communicate with one another through the network.

10. **Job accounting**: Keeping track of time & resource used by various job anduser

Features of Operating System (OS)

Here is a list important features of OS:

- Protected and supervisor mode
- Allows disk access and file systems Device drivers Networking Security
- Program Execution
- Memory management Virtual Memory Multitasking
- Handling I/O operations
- Manipulation of the file system
- Error Detection and handling
- Resource allocation
- Information and Resource Protection
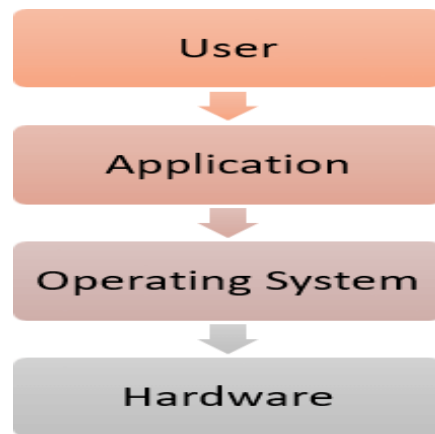
Advantage of Operating System

- Allows you to hide details of hardware by creating an abstraction
- Easy to use with a GUI.

- Offers an environment in which a user may execute programs/applications
- The operating system must make sure that the computer system convenient touse
- Operating System acts as an intermediary among applications and the hardware components
- It provides the computer system resources with easy to use format
- Acts as an intermediator between all hardware's and software's of the system

Disadvantages of Operating System

- If any issue occurs in OS, you may lose all the contents which have been storedin your system
- Operating system's software is quite expensive for small size organizationwhich adds burden on them.
- Example Window.

Types of Operating System (OS)

Following are the popular types of OS (Operating System):

- Batch Operating System
- Multitasking/Time Sharing OS
- Multiprocessing OS
- Real Time OS
- Distributed OS
- Network OS
- Mobile OS

Batch Operating System

Some computer processes are very lengthy and time-consuming. To speed the sameprocess, a job with a similar type of needs are batched together and run as a group.

The user of a batch operating system never directly interacts with the computer. Inthis type of OS, every user prepares his or her job on an offline device like a punchcard and submit it to the computer operator.

Features of Batch Operating System:-

No User Interaction: In a batch processing system, users submit their jobs or tasks to the computer to be processed in batches. Once the jobs are submitted, there is little to no user interaction during the processing of those jobs.

Sequential Execution: Jobs are executed in a sequential order, one after the other. The next job in the batch is processed only after the completion of the previous one. This sequential execution ensures a systematic and organized processing of tasks.

Limited Resource Utilization: Batch systems aim to maximize the utilization of computing resources. The system is designed to keep the CPU and other resources busy by loading and executing jobs continuously from the job queue.

Job Control Language (JCL): Batch systems typically use Job Control Language or similar scripting languages to specify the sequence of operations for each job. JCL provides a way for users to communicate with the operating system, defining job parameters, resource requirements, and execution instructions.

Automatic Job Sequencing: The operating system automatically sequences and executes jobs from the job queue without requiring manual intervention.

Multi-Tasking/Time-sharing Operating systems

Time-sharing operating system enables people located at a different terminal(shell)to use a single computer system at the same time. The processor time (CPU) whichis shared among multiple users is termed as time sharing.

A Multi-Tasking/Time-sharing Operating System is a type of operating system that allows multiple tasks or processes to run concurrently on a single computer. It achieves this by rapidly switching between tasks, giving the illusion of simultaneous execution. These operating systems efficiently manage CPU time and resources to ensure fair sharing among tasks, enabling users to run multiple applications or processes concurrently on a single machine. Examples include Windows, macOS, and Linux.

Features of Time-sharing Operating System:-

Multiuser Capability: Time-sharing systems allow multiple users to simultaneously access the system. Each user gets a fair share of the computer's resources, such as CPU time, memory, and input/output devices.

Time Slicing: The operating system divides the CPU time into small slices, or time slots, and allocates these slices to different users.

Interactive Response: Time-sharing systems are designed to provide quick response times to user inputs.

Resource Sharing: Resources such as files, devices, and programs are shared among multiple users.

Job Scheduling: Time-sharing systems employ sophisticated job scheduling algorithms to determine the order in which tasks are executed.

Real time OS:

A real time operating system time interval to process and respond to inputs is very small. Examples: Military Software Systems, Space Software Systems are the Realtime OS example.

A real-time operating system (RTOS) is a specialized type of operating system designed to manage and control hardware resources with precise timing and predictability. RTOSs are commonly used in applications where strict timing constraints and reliable performance are essential. Here are some key characteristics and features of real-time operating systems:

1. Deterministic Response:

RTOSs are designed to provide a deterministic response to tasks and events. This means that they guarantee a specific maximum response time for critical operations.

2. Task Scheduling:

RTOSs use various scheduling algorithms, such as priority-based or time-sliced scheduling, to ensure that tasks are executed in a predetermined order and within specific time limits.

3. Task Prioritization:

Tasks in an RTOS can have assigned priorities, allowing critical tasks to be executed with higher priority than less critical ones. This ensures that essential tasks are never delayed by non-essential ones.

4. Hard and Soft Real-Time:

RTOSs are categorized into hard real-time and soft real-time systems.

Hard real-time systems have strict timing requirements, and missing a deadline could have catastrophic consequences. Examples include flight control systems.

Distributed Operating System:

Distributed systems use many processors located in different machines to providevery fast computation to its users.

Network Operating System:

Network Operating System runs on a server. It provides the capability to serve tomanage data, user, groups, security, application, and other networking functions.

Mobile OS:

Mobile operating systems are those OS which is especially that are designed topower smartphones, tablets, and wearables devices.

Some most famous mobile operating systems are Android and iOS, but othersinclude BlackBerry, Web, and watch OS.

Features of Distributed Operating System:-

Concurrency: Distributed operating systems allow multiple tasks to be executed simultaneously across different machines, enhancing overall system efficiency.

 Transparency: They aim to provide transparency to users and applications   by abstracting the complexities of distributed resources. This includes location transparency, where users are unaware of the physical location of resources.

Fault Tolerance: Distributed systems are designed to be resilient in the face of failures. If one part of the system fails, other components can continue to function, ensuring the overall reliability of the system.

Scalability: Distributed operating systems can easily scale by adding more machines to the network. This ensures that the system can handle increased workloads and demands without a significant drop in performance.

Network Operating System:-
A Network Operating System (NOS) is an operating system designed specifically for managing and coordinating network resources and services. It provides the infrastructure and tools necessary for users and devices to share and access resources such as files, printers, and data over a network. NOSs often include features like directory services, security controls, remote access capabilities, and centralized management tools to ensure efficient and secure network operations. Examples of NOSs include Microsoft Windows Server, Linux-based server distributions, and Novell NetWare, each tailored to meet the unique needs of networked environments.

Features of Network Operating System:-

User Authentication: Network operating systems provide a secure way for users to log in and access resources on the network, ensuring that only authorized individuals can use the system.

File and Print Sharing: They enable the sharing of files and printers across the network, allowing users to access and print documents from different computers on the network.

Network Security: These systems come with built-in security features to protect the network from unauthorized access, viruses, and other potential threats.

Resource Management: Network operating systems help manage network resources efficiently, ensuring that users can access the resources they need without conflicts or bottlenecks.

Conclusion

Operating systems are at the core of modern computing, and their features vary based on the intended use case. Real-time operating systems prioritize determinism, single-user operating systems focus on user-friendly interfaces, multi-user operating systems facilitate resource sharing, and network operating systems excel in managing networked resources. Understanding these features is essential for selecting the right operating system for specific applications and environments

Teacher Evaluation Sheet

Name of Student: _____ Enrollment No.: _____

Name of Program :_____ Semester:_____ _

Course Title:_____Code:_____

Title of the Micro-Project: _____

Course Outcomes Achieved:

_____

_____

_____

Evaluation as per suggested Rubric for Assessment of Micro-Project(Please tick in appropriate cell for each characteristic)

Sr. No.	Characteristic to be assessed	Poor (Marks 1 -3)	Average (Marks 4 -5)	Good (Marks 6 -8)	Excellent (Marks 9 - 10)
1	Relevance to the course				
2	Literature survey / Information collected				
3	Project Proposal				
4	Completion of target as per project proposal				
5	Analysis of data and representation				
6	Quality of prototype / Model				
7	Report Preparation				
8	Presentation				
9	Defense				

Micro-Project Evaluation Sheet

Seat No.	Process assessment		Product assessment		Total Marks 10
	Part A Project Proposal (2 marks)	Project Methodology (2 marks)	Part B Project Report/Working Model (2 marks)	Individual Presentation /Viva (4 marks)	

Note: Every course teacher is expected to assign marks for group evaluation in first 3 columnsand individual evaluation in 4th column for each group of students as per suggestedrubrics.

Comments / suggestion about team work / leadership / inter-personal communication (ifany):

_____
_____
_____
_____

Any other Comment:

_____
_____
_____
_____

Name and designation of faculty member: _____

Signature: _____

Teacher Evaluation Sheet

Name of Student: _____   Enrollment No.: _____

Name of Program :_____   Semester:_____ _

Course Title:_____**Code:**_____

Title of the Micro-Project: _____

Course Outcomes Achieved:

_____

_____

_____

Evaluation as per suggested Rubric for Assessment of Micro-Project(Please tick in appropriate cell for each characteristic)

Sr. No.	Characteristic to be assessed	Poor (Marks 1 -3)	Average (Marks 4 - 5)	Good (Marks 6 -8)	Excellent (Marks 9 - 10)
1	Relevance to the course				
2	Literature survey / Information collected				
3	Project Proposal				
4	Completion of target as per project proposal				
5	Analysis of data and representation				
6	Quality of prototype / Model				
7	Report Preparation				
8	Presentation				
9	Defense				

Micro-Project Evaluation Sheet

Seat No.	Process assessment		Product assessment		Total Marks 10
	Part A Project Proposal (2 marks)	Project Methodology (2 marks)	Part B Project Report/Working Model (2 marks)	Individual Presentation /Viva (4 marks)	

Note: Every course teacher is expected to assign marks for group evaluation in first 3 columnsand individual evaluation in 4th column for each group of students as per suggestedrubrics.

Comments / suggestion about team work / leadership / inter-personal communication (ifany):

_____

_____

_____

_____

Any other Comment:

_____

_____

_____

_____

Name and designation of faculty member: _____

Signature: _____

Teacher Evaluation Sheet

Name of Student: _____ Enrollment No.: _____

Name of Program : _____ Semester: _____ _

Course Title: _____ **Code:** _____

Title of the Micro-Project: _____

Course Outcomes Achieved:

_____

_____

_____

Evaluation as per suggested Rubric for Assessment of Micro-Project(Please tick in appropriate cell for each characteristic)

Sr. No.	Characteristic to be assessed	Poor (Marks 1 -3)	Average (Marks 4 -5)	Good (Marks 6 -8)	Excellent (Marks 9 - 10)
1	Relevance to the course				
2	Literature survey / Information collected				
3	Project Proposal				
4	Completion of target as per project proposal				
5	Analysis of data and representation				
6	Quality of prototype / Model				
7	Report Preparation				
8	Presentation				
9	Defense				

Micro-Project Evaluation Sheet

Seat No.	Process assessment		Product assessment		Total Marks 10
	Part A Project Proposal (2 marks)	**Project Methodology (2 marks)**	**Part B Project Report/Working Model (2 marks)**	**Individual Presentation /Viva (4 marks)**	

Note: Every course teacher is expected to assign marks for group evaluation in first 3 columnsand individual evaluation in 4th column for each group of students as per suggestedrubrics.

Comments / suggestion about team work / leadership / inter-personal communication (ifany):

_____
_____
_____
_____

Any other Comment:

_____
_____
_____
_____

Name and designation of faculty member: _____

Signature: _____

Teacher Evaluation Sheet

Name of Student: _____ Enrollment No.: _____

Name of Program : _____ Semester:_____

Course Title: _____ **Code:** _____

Title of the Micro-Project: _____

Course Outcomes Achieved:

_____

_____

_____

Evaluation as per suggested Rubric for Assessment of Micro-Project(Please tick in appropriate cell for each characteristic)

Sr. No.	Characteristic to be assessed	Poor (Marks 1 -3)	Average (Marks 4 - 5)	Good (Marks 6 -8)	Excellent (Marks 9 - 10)
1	Relevance to the course				
2	Literature survey / Information collected				
3	Project Proposal				
4	Completion of target as per project proposal				
5	Analysis of data and representation				
6	Quality of prototype / Model				
7	Report Preparation				
8	Presentation				
9	Defense				

Micro-Project Evaluation Sheet

Seat No.	Process assessment		Product assessment		Total Marks 10
	Part A Project Proposal (2 marks)	Project Methodology (2 marks)	Part B Project Report/Working Model (2 marks)	Individual Presentation /Viva (4 marks)	

Note: Every course teacher is expected to assign marks for group evaluation in first 3 columnsand individual evaluation in 4th column for each group of students as per suggestedrubrics.

Comments / suggestion about team work / leadership / inter-personal communication (ifany):

_____
_____
_____
_____

Any other Comment:

_____
_____
_____
_____

Name and designation of faculty member: _____

Signature: _____