



SEVA MANDAL EDUCATION SOCIETY'S
Dr. BHANUBEN MAHENDRA NANAVATI COLLEGE OF HOME SCIENCE
(Empowered Autonomous Status)
NAAC Re-accredited 'A+' Grade with CGPA 3.69/4 (3rd Cycle)
UGC Status: College with Potential for Excellence
338, R.A Kidwai Road, Matunga, Mumbai 400019.

Department of Computer Applications

Syllabus for the Academic Year 2024-25

Program: Masters In Science (Computer Science)

Semester IV

SN	Courses	Type of Course	Credits	Marks
4.1	Data Communication and Networking	Major (Mandatory)	4	100
4.2	Cloud Computing	Major (Mandatory)	4	100
4.3	Networking Lab	Major (Mandatory)	2	50
4.4	Software Testing Lab	Major (Mandatory)	2	50
4.5A/ 4.5B	Digital Image Processing / Information and Cyber Security	Major (Elective)	4	100
4.6	Research Project II	Research Project	6	150
		Total	22	550

4.1: MAJOR STREAM (Mandatory)

Course Title	Data Communication and Networking
Course Credits	4
Theory Internal – External	4 Credits 50 Marks + 50 Marks
Course Outcomes	Upon completion of this course, students will be able to:
	1. Comprehend the basic concepts of computer networks and data communication systems.
	2. Analyze basic networking protocols and their use in network design
	3. Explore various advanced networking concepts.
Module 1 (Credit 1)	
Learning Outcomes	Upon completing this Module, students will be able to:
	1. Understand the concept of Internet and Intranet
	2. Have a detail understanding of Network Applications
	3. Get to know the concept of OSI Model Layers
Content Outline	Introduction to Networking Internet and Intranet, Protocol layer and their services, Network Applications like Web, HTTP, FTP and Electronic Mail in the Internet, Domain Name System, Transport-Layer Services, Multiplexing and Demultiplexing, UDP, TCP, TCP Congestion Control, Network Layer, Virtual Circuit and Datagram Networks, Need of Router, The Internet Protocol (IP), Routing Algorithms, Routing in the Internet.
Module 2 (Credit 1)	
Learning Outcomes	Upon completion of this Module, students will be able to:
	1. Understand Virtualization in detail
	2. Get deeper insight into CSV and Routing

Content Outline	Network Virtualization Need for Virtualization, The Virtual Enterprise, Transport Virtualization VNs, Central Services Access: Virtual Network Perimeter, A Virtualization Technologies primer: theory, Network Device Virtualization, Data-Path Virtualization, Control-Plane Virtualization, Routing Protocols.
Module 3 (Credit 1)	
	Upon completion of this Module, students will be able to:
Learning Outcomes)	1. Understand Adhoc Networking
	2. Get to know about various Networking technologies
	3. Learn different Routing algorithms.
Content Outline	Adhoc Networking Introduction, application of MANET, challenges, Routing in Ad hoc networks, topology & position-based approaches, Routing protocols: topology based, position based, Broadcasting, Multicasting, & Geocasting, Wireless LAN, Transmission techniques, MAC protocol issues, Wireless PANs, The Bluetooth technology.
Module 4 (Credit 1)	
Learning Outcomes	Upon completion of this unit, students will be able to:
	1. Learn Sensor networking and its types
	2. Understand Wireless sensor network
Content Outline	Wireless sensor networks Need and application of sensor networks, sensor networks design considerations, empirical energy consumption, sensing and communication range, design issues, localization scheme, clustering of SNs, Routing layer, Sensor networks in controlled environment and actuators, regularly placed sensors, network issues, RFID as passive sensors.

Assignments/Activities towards Comprehensive Continuous Evaluation (CCE):

Evaluation	Details	Marks
Internal	Unit Test	25
	Class Test, Quizzes, Assignments	25 marks
Internal		50 marks
External	Final Exams	50 marks
Total		100 marks

TEXT BOOKS:

- James F. Kurose, Keith W. Ross, Pearson (2012), Computer Networking: A Top-Down Approach 6th edition, Pearson
- Victor Moreno, Kumar Reddy, (2006), Network Virtualization, Cisco Press.
- 3. Carlos de Morais Cordeiro, Dharma Prakash Agrawal, (2011), Ad Hoc and Sensor Networks: Theory and Applications, World Scientific Publishing Company; 2nd edition

REFERENCES:

- Behrouz Forouzan, (2009), TCP/IP Protocol Suite 4 edition, McGraw-Hill Science
- Jonathan Loo, Jaime Lloret Mauri, Jesús Hamilton Ortiz, (2011), Mobile Ad Hoc Networks: Current Status and Future Trends, CRC Press
- S. Jochen Schiller, (2012), Mobile Communications, Second Edition, Pearson Education
- William Stallings, (2013), Wireless Communications and Networks, Pearson Education
- Vijay Garg, (2002), Wireless network evolution: 2G to 3G, Prentice Hall
- Ivan Stojmenovic, (2010), Handbook of Wireless Networks and Mobile Computing, Wiley India

4.2: MAJOR STREAM (Mandatory)

Course Title	Cloud Computing
Course Credits	4
Theory Internal – External	4 Credits 50 Marks + 50 Marks
Course Outcomes	Upon completion of this course, students will be able to:
	1. To learn the concept of parallel and distributed computing
	2. To enable the students to gain knowledge of cloud-based computing technologies
	3. To learn to deploy cloud-based computing environment
Module 1 (Credit 1)	

Learning Outcomes	Upon completing this Module, students will be able to:
	To elaborate the concept of parallel and distributed computing and virtualization
Content Outline	Parallel, Distributed Computing and Virtualization Elements of parallel computing, elements of distributed computing, Technologies for distributed computing: RPC, Distributed object frameworks, Service oriented computing, Virtualization – Characteristics, taxonomy, virtualization and cloud computing.
Module 2 (Credit 1)	
Learning Outcomes	Upon completion of this Module, students will be able to:
	introduce students with cloud computing services
Content Outline	Computing Platforms and Cloud technologies Cloud Computing definition and characteristics, Enterprise Computing, The internet as a platform, Cloud computing services: SaaS, PaaS, IaaS, Enterprise architecture, Types of clouds, Cloud computing platforms, Web services, AJAX, mashups, multi-tenant software, Concurrent computing: Thread programming, High-throughput computing: Task programming, Data intensive computing: Map-Reduce programming
Module 3 (Credit 1)	
Learning Outcomes	Upon completion of this Module, students will be able to:
	demonstrate the use of cloud- based software architecture
Content Outline	Software Architecture Dev 2.0 platforms, Enterprise software: ERP, SCM, CRM, Custom enterprise applications and Dev 2.0, Cloud applications.
Module 4 (Credit 1)	
Learning Outcomes	Upon completion of this unit, students will be able to:
	demonstrate the use of cloud- based services provider

Content Outline	Amazon Web Services (AWS) Essentials Architecting on AWS, building complex solutions with Amazon Virtual Private Cloud (Amazon VPC), Leverage bootstrapping and auto configuration in designs, Architect solutions with multiple regions, Employ Auto Scaling design patterns, Amazon CloudFront for caching, Big data services including AWS Data Pipeline, Amazon Redshift and Amazon Elastic MapReduce. AWS OpsWorks.
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Assignments/Activities towards Comprehensive Continuous Evaluation (CCE):

Evaluation	Details	Marks
Internal	Unit Test	25
	Class Test, Quizzes, Assignments, Presentations	25 marks
Internal		50 marks
External	Final Exams	50 marks
Total		100 marks

REFERENCES:

- Gautam Shroff, (2010), *Enterprise Cloud Computing Technology, Architecture, Applications*, Cambridge University Press
- Mastering In Cloud Computing, Tata Mcgraw-Hill Education, 2013
- Rajkumar Buyya, Christian Vecchiola And Thamari Selvi S, (2009), *Cloud Computing: A Practical Approach*, Anthony T Velte, Tata Mcgraw Hill
- Michael J. Kavis, (2014), *Architecting the Cloud: Design Decisions for Cloud Computing Service Models (SaaS, PaaS, and IaaS)*, Wiley CIO
- Kris Jamsa, Jones (2013), *Cloud Computing: SaaS, PaaS, IaaS, Virtualization, Business Models, Mobile, Security and More*, Bartlett Learning
- AWS Training, <http://aws.amazon.com/training>.

WEB RESOURCES:

- www.javatpoint.com
- www.w3schools.com
- <https://www.geeksforgeeks.org/cloud-computing/>
- <https://cloud.google.com/learn/what-is-cloud-computing>

4.3: MAJOR STREAM (Mandatory)

Course Title	Networking Lab
Course Credits	2
Practical Internal – External	2 Credits 25 Marks + 25 Marks
Course Outcomes	Upon completion of this course, students will be able to:
	1. The students will be able to configure various types of networks
	2. Implement various networks using simulating software
Module 1 (Credit 1)	
Learning Outcomes	Upon completing this Module, students will be able to:
	1. Configure ip4 and ip6 address using command in router
	2. Configure the router
	3. Configure Virtual LAN
	4. Configure Spanning tree
	5. Configure point to point protocol in router
Content Outline	Study of simulating software interface Basic Configuration of router, assigning ipv4 and ipv6 addresses to the interfaces of the routers. Configure VLANs on the router, Spanning tree, Configuration of PPP
Module 2 (Credit 1)	
Learning Outcomes	Upon completion of this Module, students will be able to:
	1. Configure Routing Information Protocol Version 2
	2. Configure Enhanced Interior Gateway Routing Protocol
	3. Configure Open Shortest Path First

	4. Configure standard and extended Access control List
	5. Configure Network Address Translation
	6. Configure Dynamic host configuration protocol
Content Outline	Configure RIPv2, Configure EIGRP, Configure OSPF. Access List Configuration, Configuration of NAT, Configuration of DHCP, Configuration of switch

Assignments/Activities towards Comprehensive Continuous Evaluation (CCE):

Evaluation	Details	Marks
Internal	Online Test, Assignments	15
	Practical Exam	10 marks
Internal		25 marks
External	Final Exam	25 marks
Total		50 marks

REFERENCES:

- Forouzan B A., "Data Communication and Networking", Third Edition, 2004, McGraw Hill.Andrew Tenenbaum, Computer Networks, PHI
- Kurose, J.F. and Ross K.W., "Computer Networking: A Top-Down Approach Featuring the Internet", Third Edition, 2005, Addison-Wesley.
- An Engineering Approach to Computer Networking, (2018) S. Keshav, Addison Wesley.

WEB RESOURCES:

- <https://www.netacad.com/cisco-packet-tracer>
- <https://www.netacad.com/courses/getting-started-cisco-packet-tracer?courseLang=en-US>
- <https://www.netacad.com/catalogs/learn/cisco-packet-tracer>

PRACTICAL LIST OF PROGRAMS:

Perform the following practical in Cisco Packet Tracer software

1. Do the basic configuration on router ie assigning IP4 and IP6 address.
2. Configure Virtual LAN on router.
3. Configure spanning tree protocol.
4. Configure Point to Point Protocol.
5. Configure Routing Information Protocol version 2.
6. Configure Enhanced Interior Gateway Routing Protocol.

7. Configure Open Shortest path.
8. Configure Standard and Extended Access Control List
9. Configure Network Address Translation.
10. Configure Dynamic Host Configuration Protocol.
11. Configure Switch and Handle VLAN

4.4: MAJOR STREAM (Mandatory)

Course Title	Software Testing
Course Credits	2
Theory Internal – External	25 Marks + 25 Marks
Course Outcomes	Upon completion of this course, students will be able to:
	1. Identify the need of software testing in current industry scenarios, techniques and tools in areas of software testing.
	2. Understand types of testing and essential characteristics of tools used for test automation.
	3. Demonstrating the ability to apply multiple methods to check the reliability of the software.
Module 1 (Credit 1)	
Learning Outcome	Upon completing this Module, students will be able to:
	1. Understand Analysis & the concepts of software testing
	2. Understand & Perform manual testing
Content Outline	<p>Introduction to Software Testing Function and non-functional Testing, Writing Test Case, Testing Framework, Test Document, Static Testing: Data Flow Analysis, Control Flow Analysis, Cyclomatic Complexity, White Box Testing: State Transition, Black box Testing: Equivalent Class Partitioning, Boundary Analysis, Cause Effect Graphing and Decision table techniques, Use case testing.</p> <p>Software Testing Strategies and Manual Testing Characteristics, Integration Testing, Functional Testing, Object-oriented Testing, Alpha and Beta Testing, overview of testing tools, Manual Testing on existing Project</p>

Module 2 (Credit 1)	
Learning Outcomes	Upon completion of this Module, students will be able to:
	1. Perform automation testing using Automation Edge
	2. Perform automation testing using JIRA
Content Outline	<p>Automation Testing using QTP AutomationEdge Introduction, Continuous Integration/Continuous Deployment (CI/CD), Robotic Process Automation (RPA), AI for Test Optimization, Cross-platform Testing</p> <p>Automation Testing using JIRA JIRA Introduction and usage, Issue and Bug Tracking, Test Case Management Integration, Advanced Reporting and Dashboards, Custom Fields and Issue Types</p>

Assignments/Activities towards Comprehensive Continuous Evaluation (CCE):

Evaluation	Details	Marks
Internal	Online Test, Assignments	15
	Practical Exam	10 marks
Internal		25 marks
External	Final Exam	25 marks
Total		50 marks

TEXT BOOKS:

- "Software Testing: A Craftsman's Approach" by Paul C. Jorgensen"
- "The Art of Software Testing" by Glenford J. Myers, Corey Sandler, and Tom Badgett"

REFERENCES:

- "JIRA Software Essentials" by Patrick Li, 2015
- Jonathan Loo, Jaime Lloret Mauri, Jesús Hamilton Ortiz, (2011), Mobile Ad Hoc Networks: Current Status and Future Trends, CRC Press
- "Robotic Process Automation and Cognitive Automation: The Next Phase" by Mary C. Lacity and Leslie P. Willcocks
- "The JIRA Guide: A Complete User Manual for Beginners and Advanced Users" by M. P. S. Sharma

4.5A : MAJOR (ELECTIVE)

Course Title	Digital Image Processing
Course Credits	4
Theory Internal – External	4 Credits 50 Marks + 50 Marks
Course Outcomes	Upon completion of this course, students will be able to:
	1. Understand various 2D Geometric Transformations & Clipping.
	2. Understand the basic 3D Concepts & Fractals, Introduction of Animation, Image Enhancement Techniques
Module 1 (Credit 1)	
Learning Outcomes	After completing this module, students will be able to:
	1. Understand the Components of an Image Processing System
	2. Explain the Basic Concepts in Sampling and Quantization
	3. Understand Spatial and Gray-Level Resolution
Content Outline	Introduction Fundamental Steps in Digital Image Processing: Components of an Image Processing System, Basic Concepts in Sampling and Quantization, Representing Digital Images, Spatial and Gray-Level Resolution.
Module 2 (Credit 1)	
Learning Outcomes	After completing the module on Image Enhancement in the Spatial Domain , students will be able to:
	1. Understand Basic Intensity Transformation Functions
	2. Analyze the Impact of Intensity Transformation on Image Quality
Content Outline	Image Enhancement in the Spatial Domain Some Basic Intensity Transformation Functions: Image Negatives, Log Transformations, and PowerLaw Transformations. Piecewise-Linear

Module 3 (Credit 1)	
Learning Outcomes)	Upon completion of this Module, students will be able to:
	1. Implement Histogram Processing Techniques
	2. Apply Image Subtraction and Averaging
Content Outline	Transformation Functions Contrast stretching, Gray-level slicing, Bit plane slicing. Histogram Processing: Image Histogram and Histogram Equalization, Image Subtraction, and Image Averaging.
Module 4 (Credit 1)	
Learning Outcomes	Upon completion of this unit, students will be able to:
	1. Understand the Basics of Spatial Filtering
	2. Use First and Second Derivatives for Image Enhancement
Content Outline	Spatial Filtering Basics of Spatial Filtering, Smoothing Spatial Filters Smoothing Linear Filters, Order-Statistics Filters. Sharpening Spatial Filters: Use of Second Derivatives for Enhancement–The Laplacian, Unsharp masking and High Boost Filtering: Use of First Derivatives for (Nonlinear) image sharpening - The Gradient– Robert, Prewitt and Sobel Masks. Combining Spatial Enhancement Methods.

Assignments/Activities towards Comprehensive Continuous Evaluation (CCE):

Evaluation	Details	Marks
Internal	Unit Test	25
	Class Test, Quizzes, Assignments, Presentations	25 marks
Internal		50 marks
External	Final Exams	50 marks
Total		100 marks

TEXTBOOKS:

- Amrendra Sinha, ArunUdai, (2007), *Computer Graphics* –Tata McGraw-Hill Education
- Rajesh K. Maurya- Computer Graphics -- Wiley India Pvt. Limited, 2011

REFERENCE BOOKS:

- Donald Hearn and M Pauline Baker, (2007), *Computer Graphics C Version -- Computer Graphics, C Version*, 2/E, Pearson Education.
- Rafael C. Gonzalez and Richard E. Woods, (2010), *Digital Image Processing* (3rd Edition), Pearson Education.
- Roy A. Plastock, Roy A. Plastock- (2009), *Schaum's Outline of Computer Graphics* 2/E
- James D. Foley, Andries van Dam, Steven K. Feiner, John F. Hughes,(2000), *Computer Graphics: Principles and Practice in C*, Pearson Education.
- David F. Rogers, James Alan Adams, (1990), *Mathematical elements for computer graphics*, McGraw-Hill
- Peter Shirley, Stephen Robert Marschner (2009) *Fundamentals of Computer Graphics A* K Peters, Limited, 3rd ed.
- Anil K. Jain, (1989), *Fundamentals of digital image processing*, Prentice Hall

4.5B : MAJOR (ELECTIVE)

Course Title	Information and Cyber Security
Course Credits	4
Theory Internal – External	4 Credits 50 Marks + 50 Marks
Course Outcomes	Upon completion of this course, students will be able to:
	1. Knowledge about the technical and legal terms relating to cybersecurity, cyber offenses and crimes.
	2. Gain an insight to the Indian Act 2000 and the organizational implications of cyber Security
Module 1 (Credit 1)	
Learning Outcomes	Upon completing this Module, students will be able to:
	1. Get insight into Computer security
	2. Have a detail understanding of Database security

Content Outline	Computer Security Principles of Security, Different Attacks: malicious and non-malicious program, Types of Computer Criminals. Operating System Security: Protected objects and methods of protection. Memory address protection: Fence, Relocation, Base/Bound Registers, Tagged Architecture, Segmentation, Paging, Directory, access control list. Database Security: Security requirements, Integrity, Confidentiality, Availability, Reliability of Database, Sensitive data, Multilevel database, Proposals for multilevel security. Introduction to Ethical Hacking
Module 2 (Credit 1)	
Learning Outcomes	Upon completion of this Module, students will be able to:
	1. Understand in detail Network security
	2. Learn about different types of Encryption methods
	Network Security Different types of network layer attacks, Firewall (ACL, Packet Filtering, DMZ, Alerts and Audit Trails) – IDS, IPS and its types (Signature based, Anomaly based, Policy based, Honeypot based). Web Server Security: SSL/TLS Basic Protocol-computing the keys- client authentication PKI as deployed by SSL Attacks fixed in v3- Exportability-Encoding-Secure Electronic Transaction (SET), Kerberos, Secret Key Cryptography, public key cryptography, Hash function and message digest
Module 3 (Credit 1)	
Learning Outcomes)	Upon completion of this Module, students will be able to:
	1. Understand Cloud Security
	2. Learn about VSS and its types
Content Outline	Cloud Security How concepts of Security apply in the cloud, User authentication in the cloud; How the cloud provider can provide this- Virtualization System Security Issues: e.g. ESX and ESXi Security, ESX file system security storage considerations, backup and recovery- Virtualization System Vulnerabilities, security management standards SaaS, PaaS, IaaS availability management- access control- Data security and storage in cloud.
Module 4 (Credit 1)	
Learning	Upon completion of this unit, students will be able to:

Outcomes	1. Get insight into Mobile security
	2. Learn about securing wireless networks
Content Outline	Mobile Security Mobile system architectures, Overview of mobile cellular systems, GSM and UMTS Security & Attacks, Vulnerabilities in Cellular Services, Cellular Jamming Attacks & Mitigation, Security in Cellular VoIP Services, Mobile application security. Securing Wireless Networks: Overview of Wireless Networks, Scanning and Enumerating 802.11 Networks, Attacking 802.11 Networks, Bluetooth Scanning and Reconnaissance, Bluetooth Eavesdropping, Attacking & Exploiting Bluetooth, Zigbee Security & Attacks.

Assignments/Activities towards Comprehensive Continuous Evaluation (CCE):

Evaluation	Details	Marks
Internal	Unit Test	25
	Class Test, Quizzes, Assignments, Presentations	25 marks
Internal		50 marks
External	Final Exams	50 marks
Total		100 marks

TEXT BOOKS:

- Charles P. Pfleeger, Charles P. Pfleeger, Shari Lawrence Pfleeger, (2006), Security in Computing 4th edition, Prentice Hall; 4th edition
- Kia Makki, Peter Reiher, (2007), Mobile and Wireless Security and Privacy, Springer

REFERENCES:

- Tim Mather, Subra Kumaraswamy, Shahed Latif., (2009), Cloud Security and Privacy: An Enterprise Perspective on Risks and Compliance (Theory and practice), O'Reilly Media; 1 edition
- Ronald L. Krutz, Russell Dean Vines, (2010), Cloud Security: A Comprehensive Guide to Secure Cloud Computing, Wiley
- Charlie Kaufman, Radia Perlam, Mike Speciner, (2010), Network Security, Prentice Hall, 2nd Edition
- Atul Kahate, (2013), Cryptography and Network Security 3rd edition, Tata McGraw Hill Education Private Limited
- William Stallings, (2013), Cryptography and Network Security: Principles and practice 6th edition, Pearson Education

4.6: RESEARCH PROJECT

Course Title	Research Project II
Credits	6
Course Outcomes	Upon completion of this course, students will be able to:
	1. Analyze research data effectively using statistical methods and tools such as SPSS, R, and Excel.
	2. Present research findings clearly through structured tables, figures, and graphs while interpreting the results in relation to research questions and acknowledging data limitations.
	3. Connect research findings with existing literature, discuss implications for academia and industry, and identify the limitations and biases of their studies.
	4. Develop skills in formatting research papers according to academic standards
	5. Understand ethical considerations in research, including avoiding plagiarism and ensuring data integrity.
Module 1 (Credit 1)	
Learning Outcomes	After learning the module, learners will be able to
	1. To perform data analysis using appropriate statistical methods.
	2. To select and apply statistical tools/software for data handling and analysis.
Content Outline	Data Analysis and Application of Statistical Tools <ul style="list-style-type: none"> • Overview of statistical tools (e.g., SPSS, R, Excel) for research data analysis. • Techniques for quantitative and qualitative data analysis. • Data cleaning and pre-processing steps. • Application of selected statistical methods
Module 2 (Credit 1)	
Learning Outcomes	After learning the module, learners will be able to
	1. To interpret data results with relevance to research questions and hypotheses.
	2. To be able to present results clearly through visualizations, tables, and narrative explanations.
Content Outline	Presentation and Interpretation of Results <ul style="list-style-type: none"> • Structuring results: presenting tables, figures, and graphs. • Interpretation of statistical output • Addressing limitations and accuracy of data analysis.
Module 3 (Credit 1)	
Learning Outcomes	After learning the module, learners will be able to
	1. To discuss research findings in relation to existing literature and theories.
	2. Outline practical implications and limitations of the study.

Content Outline	Discussion and Implications of Findings <ul style="list-style-type: none"> • Connecting findings with literature review insights. • Implications for academia, industry, or societal impact. • Acknowledging study limitations and potential biases.
Module 4 (Credit 1)	
Learning Outcomes	After learning the module, learners will be able to
	1. To summarize key findings and conclusions.
	2. To formulate recommendations for future research directions.
Content Outline	Conclusion, Recommendations, and Future Research <ul style="list-style-type: none"> • Drawing conclusions that align with the research objectives. • Providing actionable recommendations. • Identifying potential areas for further study.
Module 5 (Credit 1)	
Learning Outcomes	After learning the module, learners will be able to
	1. To adhere to prescribed formatting and citation guidelines.
	2. To develop skills in presenting research papers for academic conferences or publications.
Content Outline	Research Paper Formatting and Presentation <ul style="list-style-type: none"> • Structure of a research paper: Abstract, Introduction, Methods, Results, Discussion, Conclusion, References. • Following citation and referencing formats (APA, IEEE, etc.). • Techniques for oral presentation: summarizing research concisely, effective use of visual aids.
Module 6 (Credit 1)	
Learning Outcomes	After learning the module, learners will be able to
	1. To demonstrate the ability to critically evaluate and provide constructive feedback on research work.
	2. To understand ethical considerations in publishing, including plagiarism and data integrity.
	3. To prepare a research paper for final submission, adhering to ethical standards and peer feedback.
Content Outline	Peer Review Process: <ul style="list-style-type: none"> • Understanding the peer review process in academic publishing. • Techniques for giving and receiving constructive feedback. • Implementing revisions based on peer and mentor feedback. Ethical Standards in Research and Publication:

	<ul style="list-style-type: none"> • Ethical issues in research publication: plagiarism, authorship, and data transparency. • Responsible handling and reporting of data. • Avoiding common ethical pitfalls (e.g., self-plagiarism, selective reporting). <p>Final Submission and Publication Preparation:</p> <ul style="list-style-type: none"> • Preparing a final draft incorporating feedback and revisions. • Submission protocols for academic journals or conferences. • Creating supplementary materials (e.g., appendices, raw data repositories) if required.
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Assignments/Activities towards Comprehensive Continuous Evaluation (CCE):

Evaluation	Details	Marks
Internal	Data analysis report using statistical tools	25
	Presentation of research findings with interpretation	25 marks
Internal		50 marks
External	Final submission of the research paper formatted as per guidelines	50 marks
	Oral presentation and defence of the research paper	50 marks
Total		150 marks

REFERENCES:

- Christensen, L. B., Johnson, B., & Turner, L. A. (2015). *Research methods, design, and analysis*. Pearson.
- Hering, H. (2019). *How to write technical reports*. Springer.
- Kamath, R., & Udipi, S. (2010). *Thesis and scientific writing: Process, form, and content*. Agrotech Publishing.
- Kothari, C. R. (2019). *Research Methodology: Methods and Techniques*. New Age International.

