Seva Mandal Education Society's
Smt. Kamlaben Gambhirchand Shah Department of Computer Applications
under
Dr. Bhanuben Mahendra Nanavati College of Home Science (Autonomous)
NAAC Re-Accredited 'A+' Grade with CGPA 3.69 / 4
UGC Status: College with Potential for Excellence
'Best College Award 2016-17' adjudged by S.N.D.T. Women's University
Smt. Parmeshwari Devi Gordhandas Garodia Educational Complex
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APPROVED SYLLABUS UNDER AUTONOMY AND NEW EDUCATION POLICY

PROGRAMME: MASTER OF SCIENCE (COMPUTER SCIENCE)

DEPARTMENT OF COMPUTER APPLICATIONS
SEMESTER – III (2024-25)

SYLLABUS

SN	Courses	Type of Course	Credits	Marks
3.1	Big Data Analytics and Machine Learning	Major (Mandatory)	4	100
3.2	Artificial Intelligence	Major (Mandatory)	4	100
3.3	Software Project	Major (Mandatory)	4	100
3.4	Machine Learning Lab	Major (Mandatory)	2	50
3.5A/ 3.5B	Mobile Application Development/ Modeling & Simulation	Major (Elective)	4	100
3.6	Research Project	Research Project	4	100
		Total	**22**	**550**

3.1: MAJOR (Mandatory)

Course Title	**Big Data Analytics and Machine Learning**
Course Credits	4
Theory **Internal –** **External**	4 Credits 50 Marks + 50 Marks
Course Outcomes	After going through the course, learners will be able to:
	1. To understand and learn Hadoop, Map-Reduce, NoSQL
	2. To understand and learn Hive, Pig, Machine Learning
Module 1	
Learning Outcomes *(Specific related to the Introduction to Big Data Analytics.e.g. etc…)*	After learning the module, learners will be able to:
	To introduce student to the concept of big Data, Statistical and Soft Computing Analysis of Big Data.
Content Outline	**Introduction to Big Data** Big data: Introduction to Big data Platform, Traits of big data, Challenges of conventional systems, Web data, Analytic processes and tools, Analysis vs Reporting, Modern data analytic tools, Statistical concepts: Sampling distributions, Re-sampling, Statistical Inference, Prediction error. Data Analysis: Regression modeling, Analysis of time Series: Linear systems analysis, Nonlinear dynamics, Rule induction, Neural networks: Learning and Generalization, Competitive Learning, Principal Component Analysis and Neural Networks, Fuzzy Logic: Extracting Fuzzy Models from Data, Fuzzy Decision Trees, Stochastic Search Methods.
Module 2	
Learning Outcomes *(Specific related to Hadoop, Mapreduce etc. ...)*	After learning the module, learners will be able to:
	To introduce students with Map-Reduce based computing environment used for Big Data Analysis.
Content Outline	**MAP REDUCE** Introduction to Map Reduce: The map tasks, grouping by key, the reduce tasks, Combiners, Details of MapReduce Execution, Coping with node failures. Algorithms Using MapReduce: Matrix-Vector Multiplication, Computing Selections and Projections, Union, Intersection, and Difference, Natural Join. Extensions to MapReduce: Workflow Systems, Recursive extensions to MapReduce, Common map reduce algorithms.
Module 3	
Learning Outcomes	After learning the module, learners will be able to:

(Specific related to the module. Statistical learning and Regression e.g. etc. ...)	. 1. To demonstrate standard linear methods used in Machine Learning.
Content Outline	**Machine Learning- Standard Linear methods** Statistical Learning, Assessing Model Accuracy. Linear Regression: Simple Linear Regression, Multiple Linear Regressions, Other Considerations in the Regression Model, The Marketing Plan, Comparison of Linear Regression with K-Nearest Neighbours. Classification: An Overview of Classification, Why Not Linear Regression, Logistic Regression, Linear Discriminant Analysis, A Comparison of Classification Methods.
Module 4	
Learning Outcomes *((Specific related to the module Machine Learning, Non Linear learning etc. ...)*	After learning the module, learners will be able to:
	To demonstrate standard non-linear methods used in Machine Learning.
Content Outline	**Machine Learning- Non-Linear Learning methods** Polynomial Regression, Step Functions, Basis Functions, Regression Splines, Smoothing Splines, Local Regression, Generalized Additive Models, Tree-Based Methods: The Basics of Decision Trees. Bagging, Random Forests, Boosting. Support Vector machines, Principle Component Analysis and Clustering.

Assignments/Activities towards Comprehensive Continuous Evaluation (CCE)

1. Internal 50 + External 50
2. Unit Test of 25 marks on Module 1 & 2 (Internal)
3. Written Class Test of 10 Marks on Module 3 + Online class Test of 5 Marks on Module 3 (Internal)
4. Written Class test of 10 marks on Module 4
5. Final Exam of 50 Marks Theory on Module 1 to 4 (External)

TEXT BOOKS:

1. Anand Rajaraman and Jeffrey David Ullman, *Mining of Massive Datasets*, Cambridge University Press, 2012.
2. Michael Minelli, (2013), *Big Data, Big Analytics: Emerging Business Intelligence and Analytic Trends for Today's Businesses*, Wiley

REFERENCE BOOKS:

1. J. Hurwitz, et al., (2013), *Big Data for Dummies*, Wiley

2. Paul C. Zikopoulos, Chris Eaton, Dirk deRoos, Thomas Deutsch, George Lapis, (2012), *Understanding Big Data Analytics for Enterprise Class Hadoop and Streaming Data*, McGraw-Hill
3. James Manyika , Michael Chui, Brad Brown, Jacques Bughin, Richard Dobbs, Charles Roxburgh, Angela Hung Byers, (2011), *Big data: The next frontier for innovation, competition, and productivity*, McKinsey Global Institute
4. Pete Warden, (2011), *Big Data Glossary*, O'Reilly
5. David Loshin, (2013), *Big Data Analytics: From Strategic Planning to Enterprise Integration with Tools, Techniques, NoSQL, and Graph*, Morgan Kaufmann Publishers
6. Kevin P Murphy, (2012), *Machine Learning: A Probabilistic Perspective:* The MIT Press Cambridge
7. Ethem Alpaydın, (2015), *Introduction to Machine Learning* (Third Edition): The MIT Press
8. Christopher M. Bishop, (2006) *Pattern Recognition and Machine Learning*: Springer
9. Peter Harrington, (2012), *Machine Learning in Action*: Manning Publications
10. Brett Lantz, (2013), Machine *Learning with R:* Packt Publishing

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3.2: MAJOR (Mandatory)

Course Title	**Artificial Intelligence**
Course Credits	4
Theory **Internal –** **External**	4 Credits 50 Marks + 50 Marks
Course Outcomes	After going through the course, learners will be able to
	Understand various problems which will be solvable by using Artificial Intelligence concepts
	Familiar with Artificial Intelligence, its foundation and principles.
	Examine the useful search techniques, knowlegde representation techniques.
	Understand important concepts like Expert systems, AI applications
	Learn to write programs using Artificial Intelligence programming languages (LISP and PROLOG)
Module 1	
Learning Outcomes *(Specific related to the module.e.g. Define, Differentiate, Carry out, Design, etc. …)*	After learning the module, learners will be able to
	Learn the concept of AI and search teachniques

Content Outline	**Introduction to Artificial Intelligence** **Introduction:** Concepts & definitions of AI, Brief history of AI, State space search: Generate and test, Simple search, Depth First Search (DFS), Breadth First Search (DFS), Comparison and quality of solutions. Best First Search (BFS), Hill Climbing, A* algorithm.
Module 2	
Learning Outcomes *(Specific related to the module. e.g. Define, Differentiate, Carry out, Design, etc. …)*	After learning the module, learners will be able to
	Learn to study propositional logic and first order predicate logic and use the technique to solve logical reasoning problems.
	Learn to develop and use fuzzy arithmetic tools in solving problems
Content Outline	**Knowledge Representation** Propositional and Predicate Logic: Syntax and semantics for prepositional logic (PL) and first order propositional logic (FOPL), Properties of well-formed formula (wff), Inference rules. First Order Predicate Logic: Syntax of Predicate Logic, Prenex Normal Form (PNF), (Skolem) Standard Form, Applications of FOPL. Deductive Inference Rules and Methods: Basic Inference Rules and Application in PL, Basic Inference Rules and Application in FOPL, Resolution Method in PL and FOPL. Fuzzy Logic: Fuzzy Sets, Fuzzy Operators & Arithmetic, Membership Functions, Fuzzy Relations.
Module 3	
Learning Outcomes *(Specific related to the module. e.g. Define, Differentiate, Carry out, Design, etc. …)*	After learning the module, learners will be able to
	Learn to write programs using the syntax of AI programming languages (LISP and PROLOG)
Content Outline	**AI Programming Languages & Applications of AI** AI Programming Languages: Introduction to LISP, Syntax and Numeric Functions, Basic List Manipulation Functions in LISP Functions, Predicates and Conditionals, Input, Output, and Local Variables, Iteration and Recursion, Property Lists and Arrays, PROLOG: List, Operators, Arithmetic, Cut and Fail operator, Backtracking.
Module 4	
Learning Outcomes	After learning the module, learners will be able to

(Specific related to the module. e.g. Define, Differentiate, Carry out, Design, etc. …)	Learn a detailed study of Expert System.
Content Outline	**Expert Systems:** Introduction and Concept of Planning, Representing and Using Domain Knowledge Expert System Shells, Knowledge Acquisition. Intelligent Agents: Agents and environments, Rationality and other performance measures, Nature of environments, Structure of agents.

Assignments/Activities towards Comprehensive Continuous Evaluation (CCE)

1. Internal 50 + External 50
2. Written Unit Test – I on Module 1 (Marks 25) (Internal)
3. Assignments will be given on Module 2. (Marks 5) (Internal)
4. Assignments will be given on Module 3. (Marks 5) (Internal)
5. Online Class test will be conducted on Module 4(Marks 15) (Internal)
6. Final Exam Theory for 50 Marks.(External)

TEXT BOOK:

1) Deepak Khemani, (2013), A First course in Artificial Intelligence, Tata McGraw Hill Education (India) private limited
2) Ben Coppin, Jones, (2004), Artificial Intelligence Illuminated, Bartlett Publishers Inc.

REFERENCE BOOKS:

1) Stuart Jonathan Russell, Peter Norvig, (2010), Artificial Intelligence: A Modern Approach, 3e, Prentice Hall Publications.
2) M Tim Jones (2008), Artificial Intelligence A Systems Approach, Firewall media, New Delhi
3) George Lugar, (2002), Artificial Intelligence -Structures and Strategies for Complex Problem Solving., 4/e, Pearson Education

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3.3: MAJOR (Mandatory)

Course Title	**Software Project**
Course Credits	4
Theory – Practical **Internal – External**	4 Credits Pr – Internal, External
Course Outcomes	After going through the course, learners will be able to

	1. Attain an exposure to real life organizational and environmental situations.
	2. Attain technical skills as per the requirements of the domain.
	3. Adapt professional and interpersonal ethics.
	4. Articulate SDLC phases in developing software project and in writing the project Document
Module 1	
Learning Outcomes	After learning the module, learners will be able to
	1. Identifying the problem. 2. Identify feasibility, how to gather information and analyse them.
Content Outline	Problem Identification, Feasibility study, Requirement Gathering, Requirement Analysis
Module 2	
Learning Outcomes	After learning the module, learners will be able to
	1. Do planing and design part of project.
Content Outline	Project planning, design
Module 3	
Learning Outcomes	After learning the module, learners will be able to
	1. Do the coding, soling errors and generate the report.
Content Outline	Project Coding and Testing
Module 4	
Learning Outcomes	After learning the module, learners will be able to
	1. Testing and presentation the project.
Content Outline	Final Presentation of the Project

Assignments/Activities towards Comprehensive Continuous Evaluation (CCE)

1. Internal Assessment
Module 1 Presentation (50 Marks), module 2 presentation (30 Marks), Module 3 Presentation (20 marks),
2. External Assessment – Module 4 Presentation (50 Marks)

TEXT BOOKS:

1) Roger S Pressman, Software Engineering, 5th and 7th edition, McGraw Hill publication.
2) Kathy Schwalbe, Managing Information Technology Project, 6edition, Cengage Learning publication.

REFERENCE BOOKS:

1) Jack T Marchewka , Information Technology Project Management , Wiley India publication.
2) KK Agrawal, Yogesh Singh, Software Engineering 3rd edition by New Age International publication.
3) Richard H. Thayer, Software Engineering Project Management, Wiley India Publication.
4) Douglas Bell, Software Engineering for students: A Programming Approach, Pearson publication.

3.4: MAJOR (Mandatory)

Course Title	**Machine Learning Lab**
Course Credits	2
Theory Internal – External	2 Credits 25 Marks(Internal)+ 25 Marks(External)
Course Outcomes	After going through the course, learners will be able to
	1. Understand various problem-solving methods machine learning techniques
	2. Acquire the knowledge about classification and regression techniques where a learner will be able to explore his skill to generate data base knowledge using the prescribed techniques.
	3. Learn in depth linear and non-linear methods of machine learning
	4. Understand and implement the techniques for extracting the knowledge using machine learning method
Module 1	

Learning	After learning the module, learners will be able to

Outcomes *(Specific related to the module.e.g. Define, Differentiate, Carry out, Design, etc. …)*	1. Learn implementation of Regression Techniques using R/ Python/Weka etc. 2. . Learn the relationship between a dependent variable and one or more independent variables 3. Learn the comparison of Linear Regression with K-Nearest Neighbors 4. Learn implementation of classification method (supervised machine learning method) using R/ Python/Weka etc. 5. Learn to train and test data set. 6. Learn to perform prediction on new unseen data.
Content Outline	**Standard Linear methods – Regression** Practical sessions on Statistical Learning, Assessing Model Accuracy. Linear Regression: Simple Linear Regression, Multiple Linear Regressions, Other Considerations in the Regression Model, The Marketing Plan, Comparison of Linear Regression with K-Nearest Neighbors. **Standard Linear methods – Classification** Practical Sessions on Classification: Logistic Regression, LinearDiscriminant Analysis, A Comparison of Classification Methods performance.
Module 2	
Learning Outcomes *(Specific related to the module. e.g. Define, Differentiate, Carry out, Design, etc. …)*	After learning the module, learners will be able to 1. Learn implementation of Tree Based Methods using R/ Python/Weka etc. 2. Learn implementation of SVM , PCA using R/ Python/Weka etc.
Content Outline	**Non-Linear Learning methods - Tree-Based Methods** Practical sessions on Polynomial Regression, Step Functions, Basis Functions, Regression Splines, Smoothing Splines, Local Regression,Generalized Additive Models, Tree-Based Methods: The Basics of Decision Trees. Bagging, Random Forests, Boosting **Non-Linear Learning methods - SVM** Practical sessions on Support Vector machines, Principle Component Analysis and Clustering

Assignments/Activities towards Comprehensive Continuous Evaluation (CCE)

1. Internal 25 + External 25
2. Practical Exam 1 will be conducted for 10 Marks on Module 1 & 2 (Internal)
3. Practical Exam 2 will be conducted for 10 Marks on Module 3 & 4 (Internal)
4. Students will be evaluated using Lab Manual (5 Marks) (Internal)
5. Final Practical Exam of 25 Marks on Module 1 to 4 (External)

TEXT BOOKS:

1. David Loshin, (2013), Big Data Analytics: From Strategic Planning to Enterprise Integration with Tools, Techniques, NoSQL, and Graph, Morgan Kaufmann Publishers
2. Kevin P Murphy, (2012), Machine Learning: A Probabilistic Perspective: The MIT Press Cambridge

REFERENCE BOOKS:

1. Pete Warden, (2011), *Big Data Glossary*, O'Reilly
2. Ethem Alpaydın, (2015), *Introduction to Machine Learning* (Third Edition): The MIT Press
3. Christopher M. Bishop, (2006) *Pattern Recognition and Machine Learning*: Springer
4. Andreas C. Muller & Sarah Guido, (2016) *Introduction to Machine Learning with Python : A Guide for Data Scientists*
5. Peter Harrington, (2012), *Machine Learning in Action*: Manning Publications
6. Brett Lantz,(2013), *Machine Learning with R:* Packt Publishing

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3.5A: MAJOR (Elective)

Course Title	**Mobile Application Development**
Course Credits	4
Theory Internal – External	4 Credits
	50 Marks + 50 Marks

Course Outcomes	**After going through the course learners will be able to:**
	- Understand the entire Android Apps Development Cycle.
	- Apply the advanced android development techniques.
	- Conceptualize the design of user applications using User Experience Design.
	- Demonstrate Android activities life cycle.
	- Apply proficiency in coding on a mobile programming platform.
	- Design and develop innovative android applications.
	- Create real-life applications with an end-to-end understanding of User experience practices.

Module No.1	
Learning Outcomes	After learning the module, learners will be able to:
	- Identify Android platform features.
	- Understand the layers of Android and various Android components.
	- Create an Android application.

Module No.1	
Content Outline	**Introduction to Android**
	- The Android platform
	- Layers of Android
	- Four kinds of Android components
	- Understanding the androidManifest.xml file
	- Creating an Android application

Module No.2	
Learning Outcomes	After learning the module, learners will be able to:
	- Introduce UI and data operations.
	- Work with views and use resources in an application.
	- Use intents and services for better user experience.
	- Store and retrieve data using file systems and shared preferences.
Content Outline	**User Interface and Data Operations**
	- Creating the activity
	- Working with views
	- Using resources
	- Using intents and services
	- Using the file system
	- Working with shared preferences

Module No.3	
Learning Outcomes	After learning the module, learners will be able to:
	- Integrate Android platform with various APIs.
	- Use location services, maps, and network operations.
	- Perform network operations asynchronously.
Content Outline	**Location Sensors and REST API Integration**
	- Using Location Manager and Location Provider
	- Working with maps
	- Working with GPS, Bluetooth, and WiFi
	- Integrating Google Maps services for push notification
	- Using AsyncTask for network operations
	- Introduction to HttpUrlConnection and JSON
	- Working with OkHttp, Retrofit, and Volley

Module No.4	
Learning Outcomes	After learning the module, learners will be able to:
	- Understand database connectivity in Android applications.
	- Use SQLite for Android database connectivity.

Module No.4	
	- Package and test applications for distribution on Google Play Store.
Content Outline	**Database Connectivity and Distributing Android Applications**
	- SQLite Programming
	- Android database connectivity using SQLite
	- Distribution options
	- Packaging and testing the application
	- Distributing applications on Google Play Store

Assignments/Activities towards Comprehensive Continuous Evaluation (CCE)

- Internal 50 + External 50
- Unit Test of 25 marks on Module 1 (Internal)
- Oral Presentation of 10 Marks on Module 2 (Internal)
- Class Test of 10 Marks on Module 3 (Internal)
- Assignment of 5 Marks on Module 4 (Internal)

Final Exam of 50 Marks Theory on Module 1 to 4 (External)

TEXT BOOKS

1. W. Frank Ableson, Robi Sen, Chris King, C. Enrique Ortiz, Android in Action, Third Edition, Dreamtech Press.

REFERENCE BOOKS

1. Wei-Meng Lee, Beginning Android 4 Application Development, Wrox Publications.
2. Ed Burnette, Hello Android: Introducing Google's Mobile Development Platform, Fourth Edition, SPD Publications.

3.5B MAJOR (ELECTIVE)

Course Title	**Modeling & Simulation**
Course Credits	4
Theory **Internal – External**	4 50 + 50
Course Outcomes	After going through the course, learners will be able to

	3. Understand the techniques of modeling in the context of hierarchy of knowledge about a system and develop the capability to apply the same to study systems
	4. learn different types of simulation techniques
Module 1	
Learning Outcomes *(Specific related to the module.e.g. Define, Differentiate, Carry* *out, Design, etc. …)*	After learning the module, learners will be able to 1. Study the basics of modeling paradigms appropriate for conducting simulations
Content Outline	● **Simulation Concepts:** Systems, modeling, general system theory, concept of simulation, simulation as a decision making tool, types of simulation
Module 2	
Learning Outcomes *(Specific related to the module. e.g. Define, Differentiate, Carry* *out, Design, etc. …)*	After learning the module, learners will be able to 1. Learn various distributions and testing of random numbers
Content Outline	• **Random Numbers:** Pseudo random numbers, methods of generating random varieties, discrete and continuous distributions, testing of random numbers
Module 3	
Learning Outcomes *(Specific related to the module. e.g. Define, Differentiate, Carry* *out, Design, etc. …)*	After learning the module, learners will be able to 1. Understand the concept of designing simulation experiments
Content Outline	● **Design and simulation experiments:**

	Problem formulation, data collection and reduction, time flow mechanism, key variables, logic flow chart, starting condition, run size, experimental design consideration, output analysis and interpretation validation
Module 4	
Learning Outcomes *(Specific related to the module. e.g. Define, Differentiate, Carry out, Design, etc. …)*	After learning the module, learners will be able to 1. Learn various simulation-based case studies
Content Outline	● **Simulation Languages and Case Studies:** Comparison, and selection of simulation languages, study of any one simulation language, development simulation models using the simulation language studied for systems like queuing systems, production systems, inventory systems.

Assignments/Activities towards Comprehensive Continuous Evaluation (CCE)

1. Internal 50 + External 50
2. Unit Test of 25 marks on Module 1 (Internal)
3. Assignment of 10 Marks on Module 2 & 3+ Online class Test of 15 Marks on Module 4 (Internal)
4. Final Exam of 50 Marks Theory on Module 1 to 4 (External)

TEXT BOOKS:

1) Ross, (2010), *Simulation*, 4e, Elsevier, ISBN-9788131214626

REFERENCE BOOKS:

1) Zeigler, Theory of Modeling and Simulation, 2e, Elsevier, ISBN-9788131207406
2) Birta, Modeling and Simulation: Exploring Dynamic System Behaviour, Springer,
3) IBSN978-81-8489-365-6
4) Jerry Banks and John, S. Carson, Discrete Event System Simulation, PHI
5) Shannon, R.E., Systems Simulation, The Art and Science, PHI

3.6 : RESEARCH PROJECT

Course Title	**Research Project**

Course Credits	4
Course Outcomes	After going through the course, learners will be able to
	• To develop research skills through conducting literature reviews, formulating research questions, and selecting appropriate methodologies.
	• To plan and execute research project
Module 1 ***(Introduction to the process of conducting research)***	
Learning Outcomes *(Specific related to the module.e.g. Define, Differentiate, Carry* *out, Design, etc. …)*	After learning the module, learners will be able to
	1. Articulate and construct clear and focused problem statements, aims, objectives, and research questions. 2. Demonstrate proficiency in developing comprehensive dissertation research proposals 3. Understand and apply ethical principles in research
Content Outline	• Describe the research process • Writing a problem statement, aim, objectives and research question. • Preparing a dissertation research proposal - purpose, elements, approval • Research proposal format - Presenting a research strategy - significance, innovation, approach - proposed methodology, timelines for proposed research, bibliography and citations. • Ethical issues concerning participants, seeking consent, confidentiality, bias
Module 2 ***(Review of Literature)***	
Learning Outcomes *(Specific related to the module. e.g. Define, Differentiate, Carry* *out, Design, etc. …)*	After learning the module, learners will be able to
	1. Demonstrate proficiency in identifying and selecting appropriate types of literature sources 2. Develop effective literature search strategies 3. To construct a well-organized literature review outline
Content Outline	• Types of Literature Sources: Journal Articles, Books, Magazines and Newspapers, Reports, Websites and Reference Material. • Literature search strategies and relevant databases • Creating a literature review outline - Structuring the Literature review: Introduction, Sections (headings) Formatting

	• Organizing literature search data - Integrating literature sources in the review - quotations, paraphrasing and summarizing, maintaining academic honesty • Finalizing the literature review - using in text citations and referencing styles.
Module 3 ***(Methodology)***	
Learning Outcomes *(Specific related to the module. e.g. Define, Differentiate, Carry* *out, Design, etc. …)*	After learning the module, learners will be able to 1. To formulate clear and testable hypotheses that effectively guide the research investigation and align with the research objectives. 2. Demonstrate competence in planning and implementing data collection strategies
Content Outline	• Formulating a hypothesis • Formulating objectives of the research study • Data collection tool validation • Describing a sampling method, subject selection, procedure for sample selection. • Understanding data collection methods and tools for data collection • Planning data collection strategies
Module 4	
Learning Outcomes *(Specific related to the module. e.g. Define, Differentiate, Carry* *out, Design, etc. …)*	After learning the module, learners will be able to 1. Plan and outline the structure of their research project 2. Demonstrate proficiency in planning for data analysis
Content Outline	**Chapterization and Structure:** Defining and structuring chapters for the research project, including introduction, literature review, methodology, and potentially other relevant sections based on the research topic. **Data Analysis Planning:** Understanding different methods and techniques for analyzing research data, selecting appropriate methods based on research objectives and data type, and planning the steps for data analysis.

Assignments/Activities towards Comprehensive Continuous Evaluation (CCE)

1. Individual and group assignments.

2. Prepare a research proposal/ report

3. Writing a review of literature

4. Focussed Group Discussion

References

1. Christensen, L. B., Johnson, B., Turner, L. A., & Christensen, L. B. (2015). Research methods, design, and analysis. Pearson Education, Essex.

2. Hering, H.. (2019). How to write technical reports. Springer Berlin Heidelberg.

3. Kamath, R. & Udipi, S.(2010). Thesis and scientific writing: Process form and content. Udaipur: Agrotech Publishing Academy.

4. Kothari, C. R. (2019). Research Methodology: Methods and Techniques. New Delhi: New Age International.

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