



**Government College for
Women(A), Guntur.**

**COURSE
INFORMATION
BOOKLET**

Data Science

2023-2024

**DEPARTMENT OF
COMPUTER
SCIENCE**

CONTENTS

Item	Page No
Vision & Mission of the department	2
Programme Specific Outcomes	3
List of Programmes offered by the Department	3
List of Minors offered by the Department	4-5
Course-wise syllabus with Outcomes	6-25
LSC/SDC/SEC offered by the Department	26-30



Vision and Mission of the Department

Vision

Empowering undergraduate computer science students to become globally competitive, ethically responsible and innovative problem solvers, fostering a dynamic and inclusive technological ecosystem.

Mission

1. To foster interdisciplinary collaboration by encouraging computer science students to work on projects that integrates their knowledge with other fields, such as healthcare, agriculture, or environmental sciences, to address real-world challenges.
2. To enhance digital literacy and problem-solving skills among undergraduate computer science students by engaging them in the creation of educational technology tools and resources that can benefit students and teachers at all levels.
3. To promote open-source software development practices and ethical considerations by encouraging students to contribute to open-source projects and develop solutions that prioritizes data privacy, security, and responsible AI.
4. To foster entrepreneurship and innovation by challenging students to develop startups, Apps, or services that address societal needs and encourage an entrepreneurial mindset within the computer science curriculum.

Objectives for a B.Sc. Data Science programme:

- To get acquainted with the history of Computer Science and Data Science to understand the conceptual underpinnings of the subject.
- To Develop relevant programming abilities
- To Demonstrate proficiency with statistical analysis of data
- To Analyze very large data sets in the context of real world problems
- To Develop the ability to build and assess data-based models
- To Execute statistical analyses with professional statistical software
- To develop needed skills to become a data analyst or database developer or data scientist or analytics-enable roles like a functional business analyst or a data driven manager along with ethical outlook.
- To establish a background for admission into professional Post-Graduate program.



Program Specific outcomes of B.Sc. Data Science

PSO	After completion of the B.Sc. Data Science programme, students will be able to
PSO 1	Become a skilled Data Scientist in industry, academia, or government.
PSO 2	Use specialist software tools for data storage, analysis and visualization.
PSO 3	Independently carry out research/investigation to solve practical problems.



B.Sc Data Science course structure (Three major system)

Semester	Paper	Title of the Course	Course Code	No. of hours per week	No. of Credits	CIA	S EE	Total Marks	Max Credits
I	I	Introduction to Data science with R	DS308-1	4	3	30	70	100	3
		R lab	DS308-1P	2	2		50	50	2
II	II	Programming with Python	DS308-2	4	3	30	70	100	3
		Python lab	DS308-2P	2	2		50	50	2
First phase of Apprenticeship (During Summer Vacation) – Credits-4									4
III	III	Data mining and analysis	DS308-3	4	3	30	70	100	3
		Data mining and analysis lab	DS308-3P	2	2		50	50	2
IV	IV	Big data Technology	DS308-4	4	3	30	70	100	3
		Big data Technology lab	DS308-4P	2	2		50	50	2
	V	Introduction to Artificial Intelligence	DS308-5	4	3	30	70	100	3
		Introduction to Artificial Intelligence lab	DS308-5P	2	2		50	50	2
V	6A	Soft Computing	DS308-6A	3	3	30	70	100	3
	6A-P	Soft Computing	DS308-6AP	3	3	30	50	50	2
	7A	AI Concepts and Techniques	DS308-7A	3	3	30	70	100	3
	7A-P	AI Concepts and Techniques Lab (Python/Lisp/PROLOG)	DS308-7AP	3	3		50	50	2
	OR								

	6B	Supervised Machine Learning	DS308-6B	3	3	30	70	100	3
	6B-P	Supervised Machine Learning Lab using python/R	DS308-6BP	3	3		50	50	2
	7B	Unsupervised Machine Learning	DS308-7B	3	3	30	70	100	3
	7B-P	Unsupervised Machine Learning	DS308-7BP	3	3		50	50	2
	OR								
	6C	Artificial Neural Network	DS308-6C	3	3	30	70	100	3
	6C-P	Artificial Neural Network Lab with Python/Matlab	DS308-6CP	3	3		50	50	2
	7C	Deep Learning	DS308-7C	3	3	30	70	100	3
	7C-P	Deep Learning Lab with Python	DS308-7CP	3	3		20	50	2
Third Phase of Apprenticeship – Entire 5 th or Entire 6 th Semester according to APSCHE-Credits-12									12

Note-1: For Semester–V, for the domain subject DATA SCIENCE, any one of the three pairs of SECs shall be chosen as courses 6 and 7, i.e., 6A & 7A or 6B & 7B or 6C & 7C. The pair shall not be broken (ABC allotment is random, not on any priority basis).

Note-2: *One of the main objectives of Skill Enhancement Courses (SEC) is to inculcate field skills related to the domain subject in students. The syllabus of SEC will be partially skill oriented. Hence, teachers shall also impart practical training to students on the field skills embedded in the syllabus citing related real field situations.*

B.Sc., Data Science course structure: (Single major system)

Year	Semester	Paper	Title of the Course	Course Code	No. of hours per week	No. of Credits	CIA	S EE	Total Marks	Max Credits
I	I	1	Essentials and Applications of Mathematical, Physical and Chemical Sciences	DS308-1	3	4	40	60	100	4
		2	Advances in Mathematical, Physical and Chemical Sciences		3	4	40	60	100	4
	II	3	Introduction to Data Science and R Programming		4	3	40	60	100	3
			Introduction to Data Science and R Programming Practical Course		2	1		50	50	1
		4	Descriptive Statistics		3	3	40	60	100	3
			Descriptive Statistics Practical Course		2	1		50	50	1
II	III	5	Python Programming for Data Analysis		3	3	40	60	100	3
			Python Programming for Data Analysis Practical Course		1	2		50	50	1
		6	Inferential and applied statistics		3	4	40	60	100	3
			Inferential and applied statistics Practical Course		1	2		50	50	1
		7	Data mining techniques using R		3	4	40	60	100	3
			Data mining techniques using R Practical Course		2	1		50	50	1
		8	Web technologies		3	3	40	60	100	3
			Web technologies Practical Course		2	1		50	50	1
	IV	9	Data visualization using Tableau		3	3	40	60	100	3
			Data visualization using Tableau Practical Course		2	1		50	50	1
		10	Data visualization using python		3	3	40	60	100	3

			Data visualization using python Practical Course		2	1		50	50	1
		11	Introduction to SQL & Advanced Tableau		3	3	40	60	100	3
			Introduction to SQL & Advanced Tableau Practical Course		2	1		50	50	1
III	V	12	Supervised Machine Learning with Python		3	3	40	60	100	3
			Supervised Machine Learning with Python Practical Course		2	1		50	50	1
		13	Unsupervised Machine Learning with Python		3	3	40	60	100	3
			Unsupervised Machine Learning with Python Practical Course		2	1		50	50	1
		14A	Web Scraping with Python		3	3	40	60	100	3
			Web Scraping with Python Practical Course		2	1		50	50	1
		OR								
		14B	Predictive & Advanced Analytics using R		3	3	40	60	100	3
			Predictive & Advanced Analytics using R Practical Course		2	1		50	50	1
		15A	Advanced Data Analysis Using Python		3	3	40	60	100	3
			Advanced Data Analysis Using Python Practical Course		2	1		50	50	1
		OR								
		15B	Data Wrangling with JavaScript		3	3	40	60	100	3
			Data Wrangling with JavaScript Practical Course		2	1		50	50	1
	VI	Semester Internship/Apprenticeship with 12 Credits								
	VII	16A	Big Data Analytics Using Spark & Hadoop		3	3	40	60	100	3
			Big Data Analytics Using Spark& Hadoop Practical Course		2	1		50	50	1

IV	IV	OR								
		16B	Big Data security		3	3	40	60	100	3
			Big Data security Practical Course		2	1		50	50	1
		17A	Introduction to Deep Learning		3	3	40	60	100	3
			Introduction to Deep Learning Practical Course		2	1		50	50	1
		OR								
		17B	Deep Learning with Pytorch		3	3	40	60	100	3
			Deep Learning with Pytorch Practical Course		2	1		50	50	1
		18A	AI Concepts and Techniques With Python		3	3	40	60	100	3
			AI Concepts and Techniques With Python Practical Course		2	1		50	50	1
		OR								
		18B	Data and Information Security		3	3	40	60	100	3
			Data and Information Security Practical Course		2	1		50	50	1
		SEC								
		19	Introduction to Neural Networks		3	3	40	60	100	3
			Introduction to Neural Networks Practical Course		2	1		50	50	1
		20	Natural Language Processing		3	3	40	60	100	3
			Natural Language Processing Practical		2	1		50	50	1
	VIII	21A	Research Exploration		3	3	40	60	100	3
			Research Exploration Practical Course		2	1		50	50	1
		OR								
		21B	Computational Data Science		3	3	40	60	100	3

IV			Computational Data Science Practical Course		2	1		50	50	1
		22A	Computer Vision with Python		3	3	40	60	100	3
			Computer Vision with Python Practical Course		2	1		50	50	1
		OR								
		22B	Data Wrangling with JavaScript		3	3	40	60	100	3
			Data Wrangling with JavaScript Practical Course		2	1		50	50	1
		23A	Social Media Analytics		3	3	40	60	100	3
			Social Media Analytics Practical Course		2	1		50	50	1
		OR								
		23B	Pyspark Essentials For Data Science		3	3	40	60	100	3
			Pyspark Essentials For Data Science Practical Course		2	1		50	50	1
		SEC								
		24	Business Intelligence and Visualization		3	3	40	60	100	3
			Business Intelligence and Visualization Practical Course		2	1		50	50	1
		25	Data Visualization using Java Script		3	3	40	60	100	3
			Data Visualization using Java Script Practical Course		2	1		50	50	1

GOVT.COLLEGE FOR WOMEN (AUTONOMOUS), GUNTUR

Department of Computer Science

I B.Sc. Data Science

SEMESTER-I

COURSE 1: ESSENTIALS AND APPLICATIONS OF MATHEMATICAL, PHYSICAL AND CHEMICAL SCIENCE

Theory

Credits: 4

5 hrs/week

Course Objectives:

The objective of this course is to provide students with a comprehensive understanding of the essential concepts and applications of mathematical, physical, and chemical sciences. The course aims to develop student's critical thinking, problem-solving, and analytical skills in these areas, enabling them to apply scientific principles to real-world situation.

Learning outcomes:

1. Apply critical thinking skills to solve complex problems involving complex numbers, trigonometric ratios, vectors, and statistical measures.
2. To explain the basic principles and concepts underlying a broad range of fundamental areas of physics and to connect their knowledge of physics to everyday situations.
3. To explain the basic principles and concepts underlying a broad range of fundamental areas of chemistry and to connect their knowledge of chemistry to daily life.
4. Understand the interplay and connections between mathematics, physics, and chemistry in various applications. Recognize how mathematical models and physical and chemical principles can be used to explain and predict phenomena in different contexts.
5. To explore the history and evolution of the internet and to gain an understanding of network security concepts, including threats, vulnerabilities, and countermeasures.

UNIT V: ESSENTIALS OF COMPUTER SCIENCE:

Milestones of computer evolution – Internet, history, Internet Service Providers, Types of Networks, IP, Domain Name Services, applications.

Ethical and social implication: Network and security concepts- Information Assurance Fundamentals, Cryptography- Symmetric and Asymmetric, Malware, Firewalls, Fraud Techniques- Privacy and Data Protection.

Recommended Books:

1. Functions of one complex variable by John.B.Conway, Springer - Verlag.
2. Elementary Trigonometry by H.S.Hall and S.R.Knight
3. Vector Algebra by A.R.Vasishtha, Krishna Prakashan Media(P)Ltd.
4. Basic Statistics by B.L.Agarwal, New age international Publishers
5. University Physics with Modern Physics by Hugh D. Young and Roger A. Freedman
6. Fundamentals of Physics by David Halliday, Robert Resnick, and Jearl Walker

7. Physics for “Scientists and Engineers with Modern Physics” by Raymond A. Serway and John W. Jewett Jr.
8. Physics for “Technology and Engineering”
9. Chemistry in daily life by Kirpal Singh
10. Chemistry of bio molecules by S.P.Bhutan
11. Fundamentals of Computers by V.Raja Raman
12. Cyber Security Essentials by James Graham, Richard Howard, Ryan Olson.

GOVT.COLLEGE FOR WOMEN (AUTONOMOUS), GUNTUR
Department of Computer Science
I B.Sc. Data Science
SEMESTER-I

COURSE 2: ADVANCES IN MATHEMATICAL, PHYSICAL AND CHEMICAL SCIENCES

Theory	Credits: 4	5 hrs/week
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Course Objectives:

The objective of this course is to provide students with an in-depth understanding of the recent advances and cutting-edge research in mathematical, physical, and chemical sciences. The course aims to broaden students' knowledge beyond the foundational concepts and expose them to the latest developments in these disciplines, fostering critical thinking, research skills, and the ability to contribute to scientific advancements.

Learning outcomes:

1. Explore the applications of mathematics in various fields of physics and chemistry, to understand how mathematical concepts are used to model and solve real-world problems.
2. To explain the basic principles and concepts underlying a broad range of fundamental areas of physics and to connect their knowledge of physics to everyday situations.
3. Understand the different sources of renewable energy and their generation processes and advances in nano materials and their properties, with a focus on quantum dots. To study the emerging field of quantum communication and its potential applications. To gain an understanding of the principles of biophysics in studying biological systems. Explore the properties and applications of shape memory materials.
4. Understand the principles and techniques used in computer-aided drug design and drug delivery systems, to understand the fabrication techniques and working principles of nano sensors. Explore the effects of chemical pollutants on ecosystems and human health.
5. Understand the interplay and connections between mathematics, physics, and chemistry in various advanced applications. Recognize how mathematical models and physical and chemical principles can be used to explain and predict phenomena in different contexts.

6. Understand and convert between different number systems, such as binary, octal, decimal, and hexadecimal. Differentiate between analog and digital signals and understand their characteristics. Gain knowledge of different types of transmission media, such as wired (e.g., copper cables, fiber optics) and wireless (e.g., radio waves, microwave, satellite).

UNIT V: ADVANCED APPLICATION OF COMPUTER SCIENCE

Number System - Binary, Octal, decimal, and Hexadecimal, Signals-Analog, Digital, Modem, Codec, Multiplexing, Transmission media, error detection and correction- Parity check and CRC, Networking devices- Repeater, hub, bridge, switch, router, gateway.

Recommended Books:

1. Coordinate Geometry by S.L.Lony, Arihant Publications
2. Calculus by Thomas and Finny, Pearson Publications
3. Matrices by A.R.Vasishtha and A.K.Vasishtha, Krishna Prakashan Media(P)Ltd.
4. "Renewable Energy: Power for a Sustainable Future" by Godfrey Boyle
5. "Energy Storage: A Nontechnical Guide" by Richard Baxter
6. "Nanotechnology: Principles and Applications" by Sulabha K. Kulkarni and Raghvendra A. Bohara
7. "Biophysics: An Introduction" by Rodney Cotterill
8. "Medical Physics: Imaging" by James G. Webster
9. "Shape Memory Alloys: Properties and Applications" by Dimitris C. Lagoudas
10. Nano materials and applications by M.N.Borah
11. Environmental Chemistry by Anil.K.D.E.
12. Digital Logic Design by Morris mano
13. Data Communication & Networking by Bahrouz Forouzan.

GOVT.COLLEGE FOR WOMEN (AUTONOMOUS), GUNTUR

Department of Computer Science

I B.Sc. Data Science

SEMESTER-II

COURSE 3: INTRODUCTION TO DATA SCIENCE AND R PROGRAMMING

Theory

Credits: 3

3 hrs/week

Aim and objectives of Course:

Data Science is a fast-growing interdisciplinary field, focusing on the analysis of data to extract knowledge and insight. This course will introduce students to the collection. Preparation, analysis, modeling and visualization of data, covering both conceptual and practical issues. Examples and case studies from diverse fields will be presented, and hands- on use of statistical and data manipulation software will be included.

Learning outcomes of Course:

- Recognize the various disciplines that contribute to a successful data science effort.

- Understand the processes of data science identifying the problem to be solved, data collection, preparation, modeling, evaluation and visualization.
- Be aware of the challenges that arise in Data Sciences.
- Be able to identify the application of the type of algorithm based on the type of the problem.
- Be comfortable using commercial and open source tools such as the R/Python language and its associated libraries for data analytics and Visualization.

UNIT I:

Defining Data Science and Big Data, Benefits and Uses facets of Data, Data Science Process. History and Overview of R, Getting Started with R, R Nuts and Bolts.

UNIT II:

The Data Science Process: Overview of the Data Science Process-Setting the research goal, Retrieving Data, Data Preparation, Exploration, Modeling, data Presentation and Automation. Getting Data in and out of R, Using reader package, Interfaces to the outside world.

UNIT III:

Machine Learning: Understanding why data scientists use machine learning-What is machine learning and why we should care about, Applications of machine learning in data science, Where it is used in data science, The modeling process, Types of Machine Learning-Supervised and Unsupervised.

UNIT IV:

Handling large Data on a Single Computer: The problems we face when handling large data, General Techniques for handling large volumes of data, Generating programming tips for dealing with large datasets.

UNIT V:

Sub setting R objects, Vectorised Operations, Managing Data Frames with the dplyr, Control structures, and functions, Scoping rules of R, Coding Standards in R, Loop Functions, Debugging, and Simulation. Case studies on preliminary data analysis.

TEXT BOOKS:

1. Davy Cielen, Arno.D.B.Maysman, Mohamed Ali, “Introducing Data Science” Manning Publication, 2016.
2. Roger D.Peng, “R Programming for Data Science” Lean Publishing, 2015.

REFERENCE BOOKS:

1. Nina Zumel, John Mount, “Practical Data Science with R”, Manning Publications, 2014.
2. Tony Ojeda, Sean Patrick Murphy, Benjamin Bengfort, Abhijit Dasgupta, “Practical Data Science Cookbook”, Packt Publishing Ltd.,2014.

Web References for case studies:

1. <https://www.kaggle.com/datasets>
2. <https://github.com/>

GOVT.COLLEGE FOR WOMEN (AUTONOMOUS), GUNTUR

Department of Computer Science

I B.Sc. Data Science

SEMESTER-II

COURSE 4: DESCRIPTIVE STATISTICS

Theory

Credits: 3

3 hrs/week

Course Learning Outcomes:

Students will acquire:

- Knowledge of statistics and its implementation through practical understanding for various domains related to data science.
- Knowledge of various types of data, their organization and evaluation of summary measures such as measures of central tendency and dispersion etc.
- Knowledge of other types of data reflecting quality characteristics including concepts of independence and association between two attributes.
- Insights into preliminary exploration of different types of data.
- Knowledge of correlation, regression analysis, regression diagnostics, partial and multiple correlations.

UNIT I:

Introduction to Statistics: Importance of Statistics. Scope of Statistics in different fields.

Concepts of primary and secondary data.

Diagrammatic and graphical representation of data: Histogram, frequency polygon. Pie.

Measures of Central Tendency: Mean, Median, Mode, Geometric Mean and Harmonic Mean, Median and Mode through graph.

UNIT II:

Measures of Dispersion: Range, Quartile Deviation, Mean Deviation and Standard Deviation, Variance. Central and Non-Central moments and their interrelationship. Skewness and Kurtosis.

UNIT III:

Curve Fitting: Bi-variate data, Principle of least squares, fitting of degree polynomial. Fitting of straight line, fitting of Second degree polynomial or parabola, Fitting of power curve and exponential curves.

Correlation: Meaning, Types of Correlation, Measures of Correlation: Scatter diagram, Karl Pearson's Coefficient of Correlation, Rank Correlation Coefficient (with and without ties), Bi-variate frequency distribution, correlation coefficient for bi-variate data and simple problems. Concepts of multiple and partial correlation coefficients (three variables only) and properties.

UNIT IV:

Regression: Concepts of Regression, Linear Regression, Regression lines, Regression coefficients and its properties,

Regression lines for bi-variate data and simple problems. Correlation vs Regression, sigmoid curve, derivation from linear regression to logistic regression.

UNIT V:

Attributes: Notations, Class, Order of class frequencies, Ultimate class frequencies, Consistency of data, Conditions for consistency of data for 2 and 3 attributes only, Independence of attributes, Association of attributes and its measures, Relationship between association and colligation of attributes, Contingency table: Square contingency, Mean square contingency, Coefficient of mean square contingency.

RECOMMENDED TEXT BOOKS:

1. V.k.Kapoor and S.C.Gupta: Fundamentals of Mathematical Statistics, Sultan Chand & sons, New Delhi.
2. BA/BSC I year statistics – descriptive statistics, Probability distribution – Telugu Academy – Dr.M.Jaganmohan Rao, Dr.N.Srinivasa Rao, Dr.P.Tirupathi Rao, Smt.D.Vijayalakshmi.
3. K.V.S.Sarma: Statistics Made Simple: Do it yourself on PC, PHI.

RECOMMENDED REFERENCE BOOKS:

1. Willam Feller: Introduction to Probability theory and its applications. Volume -1, Wiley
2. Goon AM, Gupta MK, Das Gupta B: Fundamentals of Statistics, Vol-1, the World press Pvt.Ltd.,Kolkata.
3. Hoel P.G: Introduction to mathematical statistics, Asia Publishing house.
4. M.Jaganmohan Rao and Papa Rao: A Text book of Statistics Paper-I.
5. Sanjay Arora and Bansilal: New Mathematical Statistics: Satya Prakashan, New Delhi.

GOVT. COLLEGE FOR WOMEN (AUTONOMOUS), GUNTUR

Department of Computer Science

II B.Sc. Data Science Semester-III

DATA MINING AND ANALYSIS

Course Code: DS308-3

Objective

- To learn data analysis techniques.
- To understand Data mining techniques and algorithms.
- Comprehend the data mining environments and application.

Outcomes :

Students who complete this course will be able to:

1. Understand and demonstrate data mining techniques.
2. Compare various conceptions of data mining as evidenced in both research and application.
3. Characterize various kinds of patterns that can be discovered by association rule mining and gain hands-on skills and experience on data mining tools.
4. Evaluate mathematical methods underlying the effective application of data mining and analyse the data using statistical methods.

Unit-I

Data mining - KDD Vs Data Mining, Stages of the Data Mining Process-Task Primitives, Data Mining Techniques – Data Mining Knowledge Representation. Major Issues in Data Mining – Measurement and Data – Data Preprocessing – Data Cleaning - Data transformation- Feature Selection - Data reduction

Unit-II: Predictive Analytics

Classification and Prediction - Basic Concepts of Classification and Prediction, General Approach to solving a classification problem- Logistic Regression - LDA - Decision Trees: Tree Construction Principle – Feature Selection measure – Tree Pruning - Decision Tree construction Algorithm, Bayesian Classification-Accuracy and Error Measures, Evaluating the Accuracy of the classifier / predictor

Unit-III : Classification

Rule Based Classification – Classification by Back propagation – Support Vector Machines – Associative Classification – Lazy Learners – Other Classification Methods – Prediction. Random Forest, Ensemble methods and Model selection.

Unit – IV: Descriptive Analytics

Descriptive Analytics - Mining Frequent Item sets - Market based model – Association and Sequential Rule Mining, Apriori algorithm, frequent data sets.

Unit - V : Cluster Analysis:

Cluster Analysis: Basic concepts and Methods – Cluster Analysis – Partitioning methods –K means, Hierarchical methods, Density Based Methods – Evaluation of Clustering – Advanced Cluster Analysis: Probabilistic model based clustering.

References

1. Adelchi Azzalini, Bruno Scapa, “Data Analysis and Data mining” , 2nd Edition, Oxford University Press Inc., 2012.
2. Jiawei Han and Micheline Kamber, “Data Mining: Concepts and Techniques”, 3rd Edition, Morgan Kaufmann Publishers, 2011.
3. Alex Berson and Stephen J. Smith, “Data Warehousing, Data Mining & OLAP”, 10th Edition, Tata Mc Graw Hill Edition , 2007.
4. G.K. Gupta, “Introduction to Data Mining with Case Studies”, 1st Edition, Eastern Economy Edition, PHI, 2006.
5. Joseph F Hair, William C Black et al, “Multivariate Data Analysis”, Pearson Education, 7th edition, 2013.

GOVT. COLLEGE FOR WOMEN (AUTONOMOUS), GUNTUR

Department of Computer Science

II B.Sc. Data Science -Semester-IV Paper-IV

BIG DATA TECHNOLOGY

Course Code: DS308-4

Objectives:

This course provides practical foundation level training that enables immediate and effective participation in big data projects. The course provides grounding in basic and advanced methods to big data technology and tools,

including Map Reduce and Hadoop and its ecosystem.

Outcome:

After completion of the course, the students will be able to :

1. Understand Big data and its analytics in the real world.
2. Analyse the Big Data framework like Hadoop to efficiently store and process Big Data to generate analytics
3. Design of Algorithms to solve Data Intensive Problems using Map Reduce Paradigm and be able to maintain files on HDFS.
4. Design and Implement Big Data Analytics using pig and Hive and Implement Big Data Activities using HBase

Unit-I: Introduction to Big Data

Introduction –Distributed File System – Big Data and its importance, Characteristics of Big Data, Limitation of Conventional Data Processing Approaches, Need of big data frameworks, Big data analytics, Limitations of Big Data and Challenges, Big data applications

Unit-II

Hadoop: Basic Concepts of Hadoop and its features -The Hadoop Distributed File System (HDFS)- Anatomy of a Hadoop Cluster - Hadoop cluster modes - Hadoop Architecture, Hadoop Storage - Hadoop daemons (Name node-Secondary name node-Job tracker-Task tracker-Data node, etc) - Anatomy of Read & Write operations – Interacting HDFS using command-line (HDFS Shell and FS shell commands) -Interacting HDFS using Java APIs – Dataflow – Blocks –Replica - YARN.

Unit-III

Hadoop Ecosystem Components – HIVE: What is HIVE, features, architecture, working of HIVE, HIVE data models, Building blocks and data file formats , PIG: Introduction, components, execution modes, data formats and models PIG versus Map reduce, HBASE: Introduction, row oriented , column oriented data stores, architecture, data model.

Unit-IV

Introduction to Map reduce: Overview, how Map reduce works, Map reduce example, Hadoop Map reduce, Job tracker.

Unit-V

Map operation, reduce operation, submitting a map reduce job, Map reduce distributed merge sort engine, fundamental data types, running a Map reduce programme, Map reduce interface.

References

1. BIG DATA and Hadoop by V.K Jain by khanna publishing
2. Boris lublinsky, Kevin t. Smith Alexey Yakubovich, “Professional Hadoop Solutions”. Wiley, ISBN : 9788126551071, 2015.
3. Chris Eaton, Dirk Deroos et al., “Understanding Big Data”, McGraw Hill , 2010.
4. Tom White, “HADOOP” : The definitive Guide”, O Reilly 2012.
5. Srinath Perera, Thilina Gunarathne, "Hadoop Map Reduce Cookbook", PACKT publishing, 2013.
6. Seema Acharya –Big Data & Analytics.

GOVT. COLLEGE FOR WOMEN (AUTONOMOUS), GUNTUR

Department of Computer Science

II B.Sc. Data Science -Semester-IV Paper-V

Introduction to Artificial Intelligence

Course Objectives:

1. To provide a strong foundation of fundamental concepts in Artificial Intelligence.
2. To provide a basic exposition to the goals and methods of Artificial Intelligence.
3. To apply the techniques in applications which involve perception, reasoning and learning.

Course Outcomes:

Upon successful completion of the course, the student will be able to:

1. Enumerate the history and foundations of Artificial Intelligence
2. Apply the basic principles of AI in problem solving
3. Choose the appropriate representation of Knowledge
4. Solve the problems with uncertainty using probability
5. Examine the Scope of AI and its societal implications

UNIT I

Introduction: What Is AI?, The Foundations of Artificial Intelligence, The History of Artificial Intelligence, The State of the Art, Agents and Environments, Good Behavior: The Concept of Rationality, The Nature of Environments, The Structure of Agents.

UNIT II

Problem Solving: Problem-Solving Agents, Example Problems, Searching for Solutions, Uninformed Search Strategies, Informed (Heuristic) Search Strategies, Local Search Algorithms and Optimization Problems, Searching with Nondeterministic Actions.

UNIT III

Knowledge Representation: Knowledge-Based Agents, Logic, Propositional Logic: A Very Simple Logic, Ontological Engineering, Categories and Objects, Events, Mental Events and Mental Objects, Reasoning Systems for Categories, The Internet Shopping World.

UNIT IV

Uncertain Knowledge and Reasoning: Acting under Uncertainty, Basic Probability Notation, Inference Using Full Joint Distributions, Independence, Bayes' Rule and Its Use, Representing Knowledge in an Uncertain Domain, The Semantics of Bayesian Networks.

UNIT V

AI present and Future: Weak AI: Can Machines Act Intelligently?, Strong AI: Can Machines Really Think?, The Ethics and Risks of Developing Artificial Intelligence, Agent Components, Agent Architectures, Are We Going in the Right Direction?, What If AI Does Succeed?

Text Books:

- 1) Stuart Russell and Peter Norvig, “Artificial Intelligence: A Modern Approach”, 3rd Edition, Pearson.
- 2) Elaine Rich and Kevin Knight, “Artificial Intelligence”, Tata McGraw Hill

GOVT. COLLEGE FOR WOMEN(AUTONOMOUS), GUNTUR

Department of Computer Science

III B.Sc. Data Science -Semester-V

Course-6A: Soft Computing

(Skill Enhancement Course (Elective), 5 credits, Max Marks: 100 + 50)

Course Code: DS308-6A

I. Learning Outcomes: Students after successful completion of the course will be able to:

- Classify various soft computing frame works
- Get familiar with the design of neural networks, fuzzy logic and fuzzy systems
- Learn mathematical background for optimized genetic programming

II. Syllabus (*Total Hours: 90 including Teaching, Lab, Field Training and unit tests etc.*)

UNIT I INTRODUCTION TO SOFT COMPUTING

Soft Computing Constituents-From Conventional AI to Computational Intelligence- Artificial neural network: Introduction, characteristics- learning methods – taxonomy – Evolution of neural networks - basic models - important technologies - applications.

UNIT II NEURAL NETWORKS

McCulloch-Pitts neuron - linear separability - hebb network - supervised learning network: perceptron networks - adaptive linear neuron, multiple adaptive linear neuron, BPN, RBF, TDNN- associative memory network: auto-associative memory network, hetero-associative memory network, BAM, hopfield networks, iterative auto associative memory network & iterative associative memory network –unsupervised learning networks: Kohonen self-organizing feature maps.

UNIT III FUZZY LOGIC-I

Membership functions: features, fuzzification, methods of membership value assignments-Defuzzification: lambda cuts - methods - fuzzy arithmetic and fuzzy measures: fuzzy arithmetic - extension principle - fuzzy

measures - measures of fuzziness -fuzzy integrals

UNIT IV FUZZY LOGIC-II

fuzzy rule base and approximate reasoning: truth values and tables, fuzzy propositions, formation of rules- decomposition of rules, aggregation of fuzzy rules, fuzzy reasoning-fuzzy inference systems-overview of fuzzy expert system-fuzzy decision making.

UNIT V GENETIC ALGORITHM

Genetic algorithm- Introduction - biological background - traditional optimization and search techniques - Genetic basic concepts - operators – Encoding scheme – Fitness evaluation – crossover - mutation - genetic programming – multilevel optimization – real life problem- advances in GA.

References:

1. J.S.R.Jang, C.T. Sun and E.Mizutani, Neuro-Fuzzy and Soft Computing, PHI / Pearson Education 2004.
2. S.N.Sivanandam and S.N.Deepa, “Principles of Soft Computing”, Wiley India Pvt Ltd, 2011.
3. S.Rajasekaran and G.A.Vijaya Lakshmi Pai, “Neural Networks, Fuzzy Logic and Genetic Algorithm: Synthesis and Applications”, Prentice-Hall of India Pvt. Ltd., 2006.
4. George J. Klir, Ute St. Clair, Bo Yuan, Fuzzy Set Theory: Foundations and publications Prentice Hall, 1997.
5. David E. Goldberg, Genetic Algorithm in Search Optimization and Machine Learning Pearson Education India, 2013.
6. James A. Freeman, David M. Skapura, Neural Networks Algorithms, Applications, and Programming Techniques, Pearson Education India, 1991.
7. Simon Haykin, Neural Networks Comprehensive Foundation Second Edition, Pearson Education, 2005.
8. Other web sources suggested by the teacher concerned and the college librarian including reading material

GOVT. COLLEGE FOR WOMEN(AUTONOMOUS), GUNTUR

Department of Computer Science

III B.Sc. Data Science Semester-V

Course-7C: Deep Learning

Course code: DS308-7C

(Skill Enhancement Course (Elective), 5 credits, Max Marks: 100 + 50)

I. Learning outcomes of Course: Students after successful completion of the course will be able to

- Solve problems in linear algebra, probability, optimization, and machine learning.
- Understand advantages and disadvantages of deep learning neural network architectures and other approaches.
- Design convolution networks for handwriting and object classification from images or video.
- Design recurrent neural networks with attention mechanisms for natural language classification, generation, and translation.

II Syllabus: (Total Hours: 90 including Teaching, Lab and internal exams, etc.)

UNIT I

Introduction to Deep Learning: Artificial intelligence, machine learning and deep learning, history of machine learning, why deep learning? Why now?

The mathematical building blocks of neural networks: A first look at a neural network, Data representations for neural networks, The gears of neural networks: tensor operations, The engine of neural networks: gradient-based optimization.

UNIT II

Getting started with neural networks: Anatomy of a neural network, Introduction to Keras, setting up a deep-learning workstation, Classifying movie reviews: a binary classification Example, classifying newswires: a multiclass classification example, Predicting house prices: a regression example.

Fundamentals of machine learning: Four branches of machine learning, Evaluating machine-learning models, Data preprocessing, feature engineering and feature learning, Over fitting and under fitting, The universal workflow of machine learning.

UNIT III

Deep learning for computer vision: Introduction to convnets, training a convnet from scratch on a small dataset, using a pretrained convent, visualizing what convnets learn.

UNIT IV

Deep learning for text and sequences: Working with text data, Understanding recurrent neural networks, Advanced use of recurrent neural networks, Sequence processing with convnets.

UNIT V

Advanced deep-learning best practices: Going beyond the Sequential model: the Keras functional API, Inspecting and monitoring deep-learning models using Keras call backs and Tensor Board, Getting the most out of your models.

References:

1. “Deep Learning with Python” by Francois Chollet, , 2018 Edition, Manning Publications.
2. “Deep Learning with Python” by Nikhil Ketkar, Jojo Moolayil, Second Edition, Apress.
3. “Python Deep Learning” by Ivan Vasilev, Daniel Slatter, Second Edition, Packt Publications.
4. Other web sources suggested by the teacher concerned and the college librarian including reading material.

GOVT. COLLEGE FOR WOMEN(AUTONOMOUS), GUNTUR

Department of Computer Science

III B.Sc. Data Science -Semester-V

Course-6B: Supervised Machine Learning

(Skill Enhancement Course (Elective), 5 credits, Max Marks: 100 + 50)

Code: DS308-6B

COURSE OBJECTIVES:

- Familiarity with a set of well-known supervised learning algorithms.
- The ability to implement some basic machine learning algorithms.
- Understanding of how machine learning algorithms are evaluated.

COURSE OUTCOMES:

- Recognize the characteristics of machine learning that make it useful to real-world Problems.
- Characterize machine learning algorithms as Supervised
- Be able to use support vector machines.
- Be able to use regularized regression algorithms.
- Understand the concept behind neural networks for learning non-linear functions.

UNIT-1

Introduction to Machine Learning : Introduction, Structure, Objectives, What is Machine Learning? Machine Learning versus Traditional Programming, The Seven Steps of Machine Learning, Applications of Machine Learning ,Types of Machine Learning, Advantages of Machine Learning, Disadvantages of Machine Learning, Most Popular Machine Learning Software Tools.

UNIT-2

Regression Algorithms: Introduction, Structure, Objectives, Introducing Supervised Learning, Types of Supervised Learning: Regression Terminologies used in Regression. Types of Linear Regression: Simple Linear Regression, Multiple Linear Regressions

UNIT-3:

Classification: Naïve Bayes algorithm, Decision Tree algorithm , Random Forest Algorithm. K-Nearest Neighbours (K-NN) algorithm, Logistic Regression, Working condition of Naïve Bayes, Decision Tree , Random Forest. K-Nearest Neighbours, Logistic Regression advantages and disadvantages of each.

UNIT-4

Support Vector Machine (SVM) Algorithm, Hyper plane, Support Vectors, and Margin, Working of SVM, Types of SVM, Applications of Support-Vector Machines, Advantages of SVM, Disadvantages of SVM.

Dimensionality Reduction: Principal Component Analysis (PCA).

UNIT-5

Artificial Neural Network (ANN), Applications, Comparison between Artificial Neural Networks (ANN) and Biological Neural Networks (BNN), Characteristics of the ANN, Perceptron, Activation Function, Multilayer Network, Back propagation algorithm, Types of Back propagation Networks, Advantages and Disadvantages

Text Books:

1. Machine Learning: The art and science of algorithms that make sense of data, Peter Flach, Cambridge.
2. Machine Learning, Tom M. Mitchell, MGH.
3. Machine Learning by Dr.RuchiDoshi, Dr.Kamal Kant Hiran, Ritesh Kumar Jain, Dr. KamleshLakhwani, bpbPublicatioins.
4. Understanding Machine Learning: From Theory to Algorithms, ShaiShalev-Shwartz, ShaiBen David, Cambridge.

GOVT. COLLEGE FOR WOMEN(AUTONOMOUS), GUNTUR

Department of Computer Science

III B.Sc. Data Science -Semester-V

Course-7B: UnSupervised Machine Learning

(Skill Enhancement Course (Elective), 5 credits, Max Marks: 100 + 50

Unsupervised Machine Learning

COURSE OBJECTIVES:

- Familiarity with a set of well-known Un supervised learning algorithms.
- The ability to implement some basic Unsupervised machine learning algorithms
- Understanding of how Unsupervised machine learning algorithms are evaluated

COURSE OUTCOMES:

- Recognize the characteristics of machine learning that make it useful to real-world Problems.
- Characterize machine learning algorithms as Un supervised
- Be able to use clustering algorithms.
- Be able to use Association algorithms
- Understand the concept behind expectation maximization algorithm and Gaussian Mixture Model.

UNIT-1

Unsupervised Learning, Structure, Objectives, Unsupervised Learning, Working of unsupervised learning, Need for using unsupervised learning, Algorithms.

UNIT-2

Clustering, K-means Clustering, Algorithm of k-mean clustering, Flowchart of k-mean clustering, A practical example of k-mean clustering, Hierarchical clustering, Two approaches to hierarchical clustering, Need of hierarchical clustering.

UNIT-3

Agglomerative hierarchical clustering, Working of agglomerative hierarchical clustering, Measuring the distance between two clusters, The dendrogram in hierarchical clustering, Creating Dendrogram, An example of hierarchical clustering,

UNIT-4

Association rule learning, Working of the association rule learning, Support, Confidence, Lift, Apriori Algorithm, Frequent Item set, Steps of Apriori Algorithm, Example of the apriori algorithm, FP-Growth Algorithm, Frequent Pattern (FP) Tree, Steps of the FP-growth algorithm, An example of FP-growth algorithm: Difference between Apriori and FP-Growth, Applications of the association rule learning

UNIT-5

Probabilistic clustering, Gaussian Distribution, Gaussian Mixture Models (GMMs), An example of Gaussian Mixture Model.

Text Books:

1. Machine Learning: The art and science of algorithms that make sense of data, Peter Flach, Cambridge.
2. Machine Learning, Tom M. Mitchell, MGH.
3. Machine Learning by Dr.Ruchi Doshi, Dr.Kamal Kant Hiran, Ritesh Kumar Jain, Dr. Kamlesh Lakhwani ,bpb Publications.
4. Understanding Machine Learning: From Theory to Algorithms, ShaiShalev-Shwartz, ShaiBen David, Cambridge.

GOVT. COLLEGE FOR WOMEN(AUTONOMOUS), GUNTUR

Department of Computer Science

III B.Sc. Data Science

Course-6C: Artificial Neural Network

Course code: DS308-6C

(Skill Enhancement Course (Elective), 5 credits, Max Marks: 100 + 50

I. Learning Outcomes: :Students after successful completion of the course will be able to

- Create different neural networks of various architectures both feed forward and feed backward.
- Perform the training of neural networks using various learning rules.
- Perform the testing of neural networks and do the perform analysis of these networks for various pattern recognition applications.

II. Syllabus: (*Total Hours: 90 including Teaching, Lab and internal exams, etc.*)

UNIT - I

Introduction: A Neural Network, Human Brain, Models of a Neuron, Neural Networks viewed as Directed

Graphs, Network Architectures, Knowledge Representation, Artificial Intelligence and Neural Networks

Learning Process: Error Correction Learning, Memory Based Learning, Hebbian Learning, Competitive, Boltzmann Learning, Credit Assignment Problem, Memory, Adaption, Statistical Nature of the Learning Process

UNIT - II

Single Layer Perceptrons: Adaptive Filtering Problem, Unconstrained Organization

Techniques, Linear Least Square Filters, Least Mean Square Algorithm, Learning Curves, Learning Rate Annealing Techniques, Perceptron –Convergence Theorem, Relation Between Perceptron and Bayes Classifier for a Gaussian Environment

UNIT-III

Multilayer Perceptron: Back Propagation Algorithm XOR Problem, Heuristics, Output Representation and Decision Rule, Computer Experiment, Feature Detection.

UNIT - IV

Back Propagation: Back Propagation and Differentiation, Hessian Matrix, Generalization, Cross Validation, Network Pruning Techniques, Virtues and Limitations of Back Propagation Learning, Accelerated Convergence, Supervised Learning

UNIT - V

Self-Organization Maps (SOM): Two Basic Feature Mapping Models, Self-Organization Map, SOM Algorithm, Properties of Feature Map, Computer Simulations, Learning Vector Quantization, Adaptive Pattern Classification

REFERENCES:

1. Neural Networks a Comprehensive Foundations, Simon Haykin, PHI edition.
2. Artificial Neural Networks - B. Vegnanarayana Prentice Hall of India P Ltd 2005
3. Neural Networks in Computer Intelligence, Li Min Fu MC GRAW HILL EDUCATION 2003
4. Neural Networks -James A Freeman David M S Kapura Pearson Education 2004.
5. Introduction to Artificial Neural Systems Jacek M. Zurada, JAICO Publishing House Ed. 2006.
6. Other web sources suggested by the teacher concerned and the college librarian including reading material.

List of LDCs, SDCs offered by the Department

GOVT. COLLEGE FOR WOMEN(AUTONOMOUS), GUNTUR

Department of Computer Science

I B.Sc.-Semester-II

Paper-SEC Digital Literacy – Syllabus

Course Code: **Credits: 2** **Hours: 2hr/Week(30 Hrs)**

Objectives: This course aims at enhancing the skill of students in Digital Literacy.

Course Learning Out comes: By undergoing the Digital Literacy course, one should acquire basic knowledge on Computer and he/she will be able to :

1. Perform operations on the computer
2. Access the Internet and finding information of interest
3. Register for an E-mail account and operating it
4. Make bill payments and use other applications of Internet
5. Create, edit and format documents using a word processor

Unit-I: (08 hrs) Operate the elements of a computer and performing operations on the computer
Operate the elements of a computer including power cord, power switch, network connecting cable, USB ports, Mouse operations, Keyboard operations, interface icons, GUI elements, Editing options, perform operations including switching on the computer, logging in, locating a file, opening a file, printing a document, storing a file with proper extension, creating a folder/ sub folder in a volume on hard disk and desktop, shifting files from one folder to another, shutting off the computer

Unit-II: (08 hrs) Access the Internet to browse information and E-mail operation
Access the Internet, use a search engine, find information on the topic of interest, register for a web-based E-mail account, access E-mail with attachments, reply to an E-mail, forward an E-mail and delete an E-mail message

Unit-III: (10 hrs) Make bill payments, other applications using Internet and word processing
Make utility bill payments, booking bus/train tickets, bank transactions, personal transactions, job search through employment portals, mobile/DTH recharge, word processing basics, creating, editing and formatting of text, saving and printing of word document

Prescribed readings:

1. Appreciation of Digital Literacy Handbook published by Department of Electronics & Information Technology, Ministry of Communications & Information Technology, Government of India

Web Resources:

1. https://youtu.be/b2X_j5Bz-VM
2. <https://youtu.be/jln3-P6L2ro>
3. <https://youtu.be/cfDisqUMIvw>
4. https://youtu.be/3h_PyURcdrc
5. <https://youtu.be/EqN0LBcydBg>

Note: Digital Literacy course should be taught by blending the practical demonstration of concepts with hands-on experience by learners using desktop/laptop computer and mobile handset devices

GOVT. COLLEGE FOR WOMEN(AUTONOMOUS), GUNTUR
Department of Computer Science
Ability Enhancement Certificate Course
Intelligent Document Processing
(Mandatory course for 1st Semester students)

Duration of the course: The course shall be for a period of 30 Days. (1 hour session every day)

Medium of instruction and examinations: The medium of instruction and examinations shall be in English.

Note :An Internal Evaluation will be for 50 Marks and the learner will be given 2 credits after the completion of the course.

Objectives:

- To give certain professional skills needed to students in the processing of documents using Microsoft Office.

Course outcomes:

After completion of the course, student will be able to:

1. Process documents as needed.
2. Use the Microsoft Office Software to process documents.
3. Work on commercial projects

SYLLABUS:

Unit-1

Introduction to MS Office - MS Word- Working with Documents -Opening & Saving files, Editing text documents, Inserting, Deleting, Cut, Copy, Paste, Undo, Redo, Find, Search, Replace, Formatting page & setting Margins, Converting files to different formats, Importing & Exporting documents, Sending files to others, Using Tool bars, Ruler, Using Icons, using help, Formatting Documents - Setting Font styles, Font selection- style, size, colour etc, Type face - Bold, Italic, Underline, Case settings, Highlighting, Special symbols, Setting Paragraph style, Alignments, Indents, Line Space, Margins, Bullets & Numbering. Setting Page style - Formatting Page, Page tab, Margins, Layout settings, Paper tray, Border & Shading, Columns, Header & footer, Setting Footnotes & end notes – Shortcut Keys; Inserting manual page break, Column break and line break, Creating sections & frames, Anchoring & Wrapping, Setting Document styles, Table of Contents, Index, Page Numbering, date & Time, Author etc., Creating Master Documents, Web page. Creating Tables- Table settings, Borders, Alignments, Insertion, deletion, Merging, Splitting, Sorting, and Formula, Drawing - Inserting Clip Arts, Pictures/Files etc., Tools – Word Completion, Spell Checks, Mail merge, Templates, Creating contents for books, Creating Letter/Faxes, Creating Web pages, Using Wizards, Tracking Changes, Security, Digital Signature. Printing Documents – Shortcut keys.

Unit-2

Introduction to MS Office – MS Excel :Spread Sheet & its Applications, Opening Spread sheet, Menus - main menu, Formula Editing, Formatting, Toolbars, Using Icons, Using help, Shortcuts, Spread sheet types. Working with Spread sheets- opening, Saving files, setting Margins, Converting files to different formats (importing, exporting, sending files to others), Spread sheet addressing - Rows, Columns & Cells, Referring Cells & Selecting Cells – Shortcut Keys. Entering & Deleting Data- Entering data, Cut, Copy, Paste, Undo, Redo, Filling Continuous rows, columns, Highlighting values, Find, Search & replace, Inserting Data, Insert Cells, Column, rows & sheets, Symbols, Data from external files, Frames, Clipart, Pictures, Files etc, Inserting Functions, Manual breaks, Setting Formula - finding total in a column or row, Mathematical operations (Addition, Subtraction, Multiplication, Division, Exponentiation), Using other Formulae. Formatting Spread sheets- Labelling columns & rows, Formatting- Cell, row, column & Sheet, Category - Alignment, Font, Border & Shading, Hiding/ Locking Cells, Anchoring objects, Formatting layout for Graphics, Clipart etc., Worksheet Row & Column Headers, Sheet Name, Row height & Column width, Visibility - Row, Column, Sheet, Security, Sheet Formatting & style, Sheet background, Colour etc, Borders & Shading – Shortcut keys.

Working with sheets – Sorting, Filtering, Validation, Consolidation, and Subtotal. Creating Charts - Drawing. Printing. Using Tools – Error checking, Spell Checks, Formula Auditing, Creating & Using Templates, Pivot Tables, Tracking Changes, Security, Customization.

Unit-3

Introduction to MS Office-MS Access: Introduction, Planning a Database, Starting Access, Access Screen, Creating a New Database, Creating Tables, Working with Forms, Creating queries, Finding Information in Databases, Creating Reports, Types of Reports, Printing & Print Preview – Importing data from other databases viz. MS Excel etc.

Unit-4

Introduction to MS Office-MS Power Point : Introduction to presentation – Opening new presentation, Different presentation templates, Setting backgrounds, Selecting presentation layouts. Creating a presentation - Setting Presentation style, Adding text to the Presentation. Formatting a Presentation - Adding style, Colour, gradient fills, Arranging objects, Adding Header & Footer, Slide Background, Slide layout. Adding Graphics to the Presentation- Inserting pictures, movies, tables etc into presentation, Drawing Pictures using Draw. Adding Effects to the Presentation- Setting Animation & transition effect. Printing Handouts, Generating Standalone Presentation viewer.

GOVT. COLLEGE FOR WOMEN(AUTONOMOUS), GUNTUR

Department of Computer Science

Certificate course -1

Audio Video Production

(For all interested students)

Eligibility for admission: Candidate for admission to the Course shall be required to have passed the +2 in State or central board of examinations.

Duration of the course: The course shall extend over a period of 40 Days (1 hour session every day)

Medium of instruction and examinations: The medium of instruction and examinations shall be in English.

Note : No Internal Evaluation. External Evaluation will be for 50 Marks and the learner will be given 1 credit after the completion of the course.

Objectives:

- To give certain professional skills needed to students in the area of Audio Video Production so that they can grow as entrepreneurs or freelancers.

Course outcomes:

After completion of the course, students will be able to:

1. Act as a director for films
2. Become a video and audio editor
3. Work on commercial projects.

SYLLABUS:

MOTION PICTURE CAMERA AND LENSES

Topics:

1. Introduction to the Principles of Cinematography
2. Mechanical parts of motion picture camera - Functions of various parts.
3. Study of lens - Study of lens systems - study of lens formats
4. Working principles of various types of shutters

5. Types of lens mounts - Matte box.
6. Frame rates - Shutter speed calculation - Shutter angle
7. The factors responsible for visual attention to the audience.
 8. Importance of the quality of a motion picture camera lens
 9. Image formation with cinematographic lens
 10. Advantages and Disadvantages of block and zoom lenses.

FUNDAMENTALS OF FILM AND VIDEO EDITING

Topics:

1. Study of the using of Editing Equipments
2. Shooting Reports - Camera Report - Sound Report and Direction Reports
3. Knowing the both Film and Video Equipments and their accessories
4. Basic systems in Video Editing
5. Study of Editorial marks -Learning about Editing of silent sequence and talkie sequence.
6. Study of Film Dubbing and video dubbing
7. Study of video effects - Using of bridging shot
8. Inter cutting- Parallel cutting and constructive editing
9. Basic Transition Visual Effects - Standard video effects Digital Video effects
10. How to use Optical effects and Mechanical effects

PRODUCING THE FILM

Topics:

1. Overview of Scheduling, Script Breakdown
2. Day -Out-of-Days Schedule, Scheduling Each Shoot Day
3. First Day of Principal Photography
4. Finding Locations, Create Location List, Specifics of Location Scouting
5. Police / Fire Department, Shoot Day Protocol
6. Sound Recording During Principal Photography
7. How to get Best Sound on Set, Audio post production
8. Creating and Recording Foley Work, Recording ADR
9. Laying in Music Tracks, Sound Mixing
10. Original Music Composition for your Project, Music Supervisors,

GOVT. COLLEGE FOR WOMEN(AUTONOMOUS), GUNTUR

Department of Computer Science

Certificate course -2

(For all the interested students)

Open Office Management

Eligibility for admission: Candidate for admission to the Course shall be required to have passed the +2 in State or central board of examinations.

Duration of the course: The course shall extend over a period of 40 Days (1 hour session every day)

Medium of instruction and examinations: The medium of instruction and examinations shall be in English.

Note :An Internal Evaluation will be for 50 Marks and the learner will be given 2 credits after the

completion of the course.

Objectives:

- To give certain professional skills needed to students in the processing of documents intelligently using advanced techniques

Course outcomes:

After completion of the course, student will be able to:

1. Process documents in a smart way.
2. Use the advanced applications available to process documents intelligently.
3. Work on commercial projects

SYLLABUS:

Unit-1

Introduction to MS Office OPEN OFFICE - WRITER: Introduction to Open Office Suite - Selecting the application package, Working with Documents- Formatting Documents - Setting Page style- Creating Tables - Drawing- Tools - Printing Documents - Operating with MS Word documents.

Unit-2

Introduction to MS Office Open Office-Calc - Introduction – Introduction to Spread sheets, Overview of a Worksheet, Creating Worksheet & Workbooks, Organizing files, Managing files & workbooks, Functions & Formulas, Working with Multiple sheets, Creating Charts & Printing Charts – Operating with MS Excel documents, which are already created and saved in MS Excel.

Unit-3

Introduction to MS Office Open Office-Base – Introduction- Database Concepts – Creating a New Database, Creating Tables, Working with Forms, Creating queries, Finding Information in Databases, Creating Reports, Types of Reports, Printing and Printing preview – Operating with other databases i.e. MS Access etc.

Unit-4

Introduction to MS Office- Open Office-Impress - Introduction – Creating Presentation, Saving Presentation Files, Master Templates & Re-usability, Slide Transition, Making Presentation CDs, Printing Handouts – Operating with MS Power Point files / slides.