



# LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING (AUTONOMOUS)

Accredited by NAAC with 'A' Grade & NBA (Under Tier - I),  
An ISO 21001:2018,14001:2015,50001:2018 Certified Institution  
Approved by AICTE, New Delhi and Affiliated to JNTUK, Kakinada  
L.B. REDDY NAGAR, MYLAVARAM, NTR DIST., A.P.-521 230.

[hodcse@lbrce.ac.in](mailto:hodcse@lbrce.ac.in), [cseoffice@lbrce.ac.in](mailto:cseoffice@lbrce.ac.in), Phone: 08659-222 933, Fax: 08659-222931

## DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

### COURSE HANDOUT

#### PART-A

**Name of Course Instructor:** Dr. K DEVI PRIYA

**Course Name & Code** :- Machine learning Lab-20AD53

**L-T-P Structure** :0-0-2

**Credits:1**

**Program/Sem/Sec** : B.Tech. – CSE V/A

**A.Y.:2022-23**

**PREREQUISITE:Knowledge of basic Computer hardware & software.**

#### **COURSE EDUCATIONAL OBJECTIVES (CEOs):**

The objective of this lab is to make use of Data sets in implementing the machine learning algorithms in any suitable language of choice.

**COURSE OUTCOMES (COs):** At the end of the course, student will be able to

<b>CO1</b>	Apply the appropriate pre-processing techniques on data set. ( <b>Apply – L3</b> )
<b>CO2</b>	Implement supervised Machine Learning algorithms. ( <b>Apply – L3</b> )
<b>CO3</b>	Implement unsupervised Machine Learning algorithms ( <b>Apply – L3</b> )
<b>CO4</b>	Improve individual / teamwork skills, communication & report writing skills with ethical values.

**COURSE ARTICULATION MATRIX(Correlation between COs, POs & PSOs):**

COs	PO1	PO2	PO3	PO4	PO5	PO6	PS01	PS02	PS03
<b>CO1</b>	2	2	3	2	3	-	-	-	-
<b>CO2</b>	2	2	2	2	3	-	-	2	-
<b>CO3</b>	2	2	3	-	3	1	2-	2	-
<b>CO4</b>	2	2	2	2	-	2	2	2	-

#### **TEXTBOOKS:**

1. Kevin Murphy, Machine Learning: A Probabilistic Perspective, MIT Press, 2012.
2. Trevor Hastie, Robert Tibshirani, Jerome Friedman, The Elements of Statistical Learning, Springer 2017(corrected copy)
3. Jiawei Han, Micheline Kamber, Jian Pei , Data Mining: Concepts and Techniques, 3/e, Morgan Kaufmann, 2011.(2016 modified copy)
4. Christopher Bishop, Pattern Recognition and Machine Learning, Springer, 2007.(2016)

#### **REFERENCE BOOKS:**

1. Shai Shalev-Shwartz, ShaiBen David, “Understanding Machine Learning: FromTheorytoAlgorithms”, Cambridge.
2. Peter Harington, “Machine Learning in Action” , Cengage, 1st edition, 2012.
3. Peter Flach, “Machine Learning: The art and science of algorithms that make sense of data”, Cambridge university press,2012.
4. Jason Brownlee, “Machine Learning Mastery with Python Understand Your Data, Create Accurate Models and Work Projects End-To-End”, Edition: v1.4, 2011.

#### **COURSE DELIVERY PLAN (LESSON PLAN):**

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Lab Cycle-1,2,3	3			<b>DM5</b>	
2.	Lab Cycle-4,5,6	3			<b>DM5</b>	
3.	Lab Cycle -7,8,9	3			<b>DM5</b>	
4.	Lab Cycle-10,	3			<b>DM5</b>	
5.	Lab Cycle-11	3			<b>DM5</b>	

<b>Teaching Learning Methods</b>			
<b>DM1</b>	Chalk and Talk	<b>DM4</b>	Assignment/Test/Quiz
<b>DM2</b>	ICT Tools	<b>DM5</b>	Laboratory/Field Visit
<b>DM3</b>	Tutorial	<b>DM6</b>	Web-based Learning

### **PART-C**

#### **EVALUATION PROCESS (R20 Regulations):**

<b>Evaluation Task</b>	<b>Marks</b>
Day-to-day work	A1 = 20
Internal test	A2 = 10
Viva	A3 = 10
<b>CIE Total: (A1+A2+A3)</b>	<b>M1 = 40</b>
Procedure/Algorithm	B1 = 10
Experimentation/Program execution	B2 = 20
Observations/Calculations/Validation	B3 = 10
Result/Inference	B4 = 10
Viva voce	B5 = 10
<b>SEE Total: (B1+B2+B3+B4+B5)</b>	<b>M2 = 60</b>
<b>Total Marks = CIE + SEE = (M1+M2)</b>	<b>100</b>

## PART-D

### PROGRAMME OUTCOMES (POs):

<b>PO 1</b>	Independently carry out research/investigation and development work to solve practical problems.
<b>PO 2</b>	An ability to write and present a substantial technical report/document.
<b>PO 3</b>	Demonstrate a degree of mastery over the area as per the specialization of the program. The mastery should be at a level higher than the requirements in the appropriate bachelor program.
<b>PO 4</b>	Design and develop software projects given their specifications and within performance and cost constraints.
<b>PO 5</b>	Design and develop software projects given their specifications and within performance and cost constraints..
<b>PO6</b>	Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

### PROGRAMME SPECIFIC OUTCOMES (PSOs):

<b>PSO 1</b>	The ability to apply Software Engineering practices and strategies in software project development using open-source programming environment for the success of organization.
<b>PSO 2</b>	The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
<b>PSO 3</b>	To inculcate an ability to analyze, design and implement database applications.

<b>Title</b>	<b>Course Instructor</b>	<b>Course Coordinator</b>	<b>Module Coordinator</b>	<b>Head of the Department</b>
<b>Name of the Faculty</b>	(Dr. K DeviPriya)	(Dr. K DeviPriya)	(Dr.K Naga prasanthi)	(Dr. D. Veeraiah)
<b>Signature</b>				



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## DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

### COURSE HANDOUT

#### PART-A

Name of Course Instructor : Dr. K DEVIPRIYA  
Course Name & Code : Machine Learning (23DS02)  
L-T-P Structure : 3-0-0 Credits : 3  
Program/Sem/Sec M. Tech. (I Sem.)-Data Science

**PRE-REQUISITE: Probability and Statistics, Data Warehousing and Data Mining**

#### **COURSE EDUCATIONAL OBJECTIVES (CEOs):**

The objective of the course provides the basic concepts and techniques of Machine Learning and helps to use recent machine learning software for solving practical problems. It enables students to gain experience by doing independent study and research.

**COURSE OUTCOMES (COs):** At the end of the course, students are able to

CO 1	Apply predictive algorithms for real-world Problems. (Apply – L3).
CO 2	Apply unsupervised learning algorithms for real; world problems (Apply-L3)
CO 3	Familiarize with functions of several variables which is useful in optimization (Apply– L3).
CO 4	Analyze Ensemble Model building and evaluation approaches (Analyze – L4)
CO 5	Learn advanced learning techniques to deal with complex data (Apply – L3).

#### **COURSE ARTICULATION MATRIX(Correlation between COs, POs & PSOs):**

COs	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3
CO1	3	2	1	2	-	1	-	2	-
CO2	3	2	-	2	-	-	2	2	-
CO3	3	2	-	-	2	1	-	2	-
CO4	3	-	2	3	2	2	-	2	-
CO5	3	1	2	3	2	2	-	2	-

**Note:** Enter Correlation Levels 1 or 2 or 3. If there is no correlation, put '-'

1- Slight (Low), 2 - Moderate (Medium), 3 - Substantial (High).

#### **TEXTBOOKS:**

1. Kevin Murphy, Machine Learning: A Probabilistic Perspective, MIT Press, 2012.
2. Trevor Hastie, Robert Tibshirani, Jerome Friedman, The Elements of Statistical Learning, Springer 2017(corrected copy)
3. Jiawei Han, Micheline Kamber, Jian Pei , Data Mining: Concepts and Techniques, 3/e, Morgan Kaufmann, 2011.(2016 modified copy)
4. Christopher Bishop, Pattern Recognition and Machine Learning, Springer, 2007.(2016)

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1. Shai Shalev-Shwartz, ShaiBen David, “Understanding Machine Learning: FromTheorytoAlgorithms”, Cambridge.
2. Peter Harington, “Machine Learning in Action” , Cengage, 1st edition, 2012.
3. Peter Flach, “Machine Learning: The art and science of algorithms that make sense of data”, Cambridge university press,2012.
4. Jason Brownlee, “Machine Learning Mastery with Python Understand Your Data, Create Accurate Models and Work Projects End-To-End”, Edition: v1.4, 2011.

## **PART-B**

### **COURSE DELIVERY PLAN (LESSON PLAN): Section A**

#### **UNIT-I : Supervised Learning**

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction- Types of Machine Learning Distance-based methods	1	4-10-2023		TLM1/TLM3/TLM5	
2.	k-Nearest Neighbour (kNN)	1	5-10-2023		TLM1/TLM3/TLM5	
3.	k-Nearest Neighbour (kNN)	1	10-10-23		TLM1/TLM3/TLM5	
4.	Decision Trees	1	11-10-23		TLM1/TLM3/TLM5	
5.	Decision Trees,	1	12-10-23		TLM1/TLM3/TLM5	
6.	Naive Bayes	1	17-10-23		TLM1/TLM3/TLM5	
7.	Linear models: Linear Regression, Multi Linear Regression	1	18-10-23		TLM1/TLM3/TLM5	
8.	Logistic Regression	1	19-10-23		TLM1/TLM3/TLM5	
9.	Support Vector Machines, Nonlinearity and Kernel Methods,	1	24-10-23		TLM1/TLM3/TLM5	
10.	Beyond Binary Classification: Multi-class	1	25-10-23		TLM1/TLM3/TLM5	
<b>No. of classes required to complete UNIT-I</b>		<b>10</b>		<b>No of classes taken</b>		

#### **UNIT-II: Unsupervised Learning:**

, , Generative Models (and)

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
11	Clustering: K-means	1	30-10-23		TLM1/TLM3/TLM5	
12	Dimensionality Reduction: PCAandkernel PCA	1	31/10/23		TLM1/TLM3/TLM5	
13	Dimensionality Reduction: PCAandkernel PCA	1	1/11/23		TLM1/TLM3/TLM5	
14.	Generative Models- Introduction.	1	1/11/23		TLM1/TLM3/TLM5	

15.	Gaussian Mixture Models	1	2/11/23		TLM1/TLM3/TLM5	
16.	Hidden Markov Models	1	6/11/23		TLM1/TLM3/TLM5	
17.	Hidden Markov Models	1	7/11/23		TLM1/TLM3/TLM5	
		<b>7</b>		<b>No of classes taken</b>		

### UNIT-III: Machine Learning Algorithms Evaluation

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
18	Evaluating Machine Learning algorithms, Model Selection,	1	8/11/23		TLM1/TLM3/TLM5	
19.	Ensemble Methods	1	9/11/23		TLM1/TLM3/TLM5	
20	Boosting	1	21/11/23		TLM1/TLM3/TLM5	
21	Bagging	1	23/11/23		TLM1/TLM3/TLM5	
22	Random Forests	1	28/11/23		TLM1/TLM3/TLM5	
<b>No. of classes required to complete UNIT-III</b>		<b>5</b>		<b>No of classes taken</b>		

### UNIT-IV: Deep Learning

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
23.	Modeling Sequence/Time-Series Data	1	29/11/23		TLM1/TLM3/TLM5	
24.	Deep Learning	2	30/11/23, 7/12/23		TLM1/TLM3/TLM5	
25	Deep auto-encoders	2	12/12/23,13-12-23		TLM1/TLM3/TLM5	
26	Applications of Deep Networks	2	14-12-23,19-12-23		TLM1/TLM3/TLM5	
27	Feature Representation Learning	2	20-12-23,21-12-23		TLM1/TLM3/TLM5	
<b>No. of classes required to complete UNIT-IV</b>		<b>9</b>		<b>No of classes taken</b>		

### UNIT-V: Types of Learning

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
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28.	Scalable Machine	1	21-12-23		TLM1/TLM3/TLM5
29.	Semi-supervised Learning,Active Learning	1	27-12-23		TLM1/TLM3/TLM5
30	Reinforcement Learning-Q learning	2	28-12-23, 2-1-24, 3-1-24		TLM1/TLM3/TLM5
31	Inference in Graphical Models	2	9-1-24, 10-1-24		TLM1/TLM3/TLM5
32	Introduction to Bayesian Learning and Inference	2	11-1-24		TLM1/TLM3/TLM5
<b>No. of classes required to complete UNIT-V</b>		<b>9</b>		<b>No of classes taken</b>	

Teaching Learning Methods			
<b>TLM1</b>	Chalk and Talk	<b>TLM4</b>	Demonstration (Lab/Field Visit)
<b>TLM2</b>	PPT	<b>TLM5</b>	ICT (NPTEL/Swayam Prabha/MOOCs)
<b>TLM3</b>	Tutorial	<b>TLM6</b>	Group Discussion/Project

### **PART-C**

#### **EVALUATION PROCESS (R20 Regulations):**

<b>Evaluation Task</b>	<b>Marks</b>
Assignment-I	A1=10
I-Mid Examination (Units-I ,II,III)	M1=30
II-Mid Examination (Units-III, IV & V)	M2=30
Assignment Marks = Average of A1, A2	A=10
Mid Marks =80% of Max(M1,M2)+25% of Min(M1,M2)	M=30
Cumulative Internal Examination (CIE) : A+B+M	40
Semester End Examination (SEE)	60
Total Marks = CIE + SEE	100

### **PART-D**

#### **PROGRAMME OUTCOMES (POs):**

<b>PO 1</b>	Independently carry out research/investigation and development work to solve practical problems.
<b>PO 2</b>	An ability to write and present a substantial technical report/document.
<b>PO 3</b>	Demonstrate a degree of mastery over the area as per the specialization of the program. The mastery should be at a level higher than the requirements in the appropriate bachelor program.
<b>PO 4</b>	Design and develop software projects given their specifications and within performance and cost constraints.
<b>PO 5</b>	Design and develop software projects given their specifications and within performance and cost constraints..

<b>P06</b>	Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
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**PROGRAMME SPECIFIC OUTCOMES (PSOs):**

<b>PSO 1</b>	The ability to apply Software Engineering practices and strategies in software project development using open-source programming environment for the success of organization.
<b>PSO 2</b>	The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
<b>PSO 3</b>	To inculcate an ability to analyze, design and implement database applications.

Course Instructor	Course Coordinator	Module Coordinator	HOD
Dr.K DeviPriya	Dr.K DeviPriya	Dr.K Naga Prasanthi	Dr.D.Veeraiah





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## DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

### COURSE HANDOUT

#### PART-A

Name of Course Instructor : Dr.D.VENKATA SUBBAIAH  
Course Name & Code : STATISTICAL FOUNDATIONS FOR DATA SCIENCE & 23DS01  
L-T-P Structure : 3-0-0 Credits: 3  
Program/Sem/Sec : M.Tech./I A.Y.: 2023-24

**PRE-REQUISITE: NIL**

**COURSE EDUCATIONAL OBJECTIVE (CEO):**

- The Number Theory basic concepts useful for cryptography etc
- The theory of Probability, and probability distributions of single and multiple random variables
- The sampling theory and testing of hypothesis and making inferences
- Stochastic process and Markov chains.

**COURSE OUTCOMES (COs):** After learning the contents of this course, the student must be able to:

<b>CO1:</b>	Apply the number theory concepts to cryptography domain	(Apply-L3)
<b>CO2:</b>	Apply the concepts of probability and distributions to some case studies	(Apply-L3)
<b>CO3:</b>	Correlate the material of one unit to the material in other units	(Apply-L3)
<b>CO4:</b>	Resolve the potential misconceptions and hazards in each topic of study.	(Apply-L3)

**TEXTBOOKS:**

1. Kenneth H. Rosen, Elementary number theory & its applications, sixth edition, Addison Wesley, ISBN 0-321-50031-1
2. Ronald E. Walpole, Raymond H. Myers, Sharon L. Myers, Keying Ye, Probability & Statistics for Engineers & Scientists, 9th Ed. Pearson Publishers.
3. S. D. Sharma, Operations Research, Kedarnath and Ramnath Publishers, Meerut, Delhi

**REFERENCE BOOKS:**

1. S C Gupta and V K Kapoor, Fundamentals of Mathematical statistics, Khanna publications
2. T.T. Soong, Fundamentals of Probability And Statistics For Engineers, John Wiley & Sons Ltd 2004.
3. Sheldon M Ross, Probability and statistics for Engineers and scientists, Academic Press

## **PART-B**

### **COURSE DELIVERY PLAN (LESSON PLAN):**

#### **UNIT – I: Fundamental Cloud Computing and Models Understanding Cloud Computing**

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Greatest common divisors	1	04-10-2023			
2.	The Euclidean algorithm	1	09-10-2023			
3.	The fundamental theorem of arithmetic	1	11-10-2023			
4.	Factorization of integers and the Fermat numbers	1	12-10-2023			
5.	Congruences: Introduction to congruences, Linear congruences	1	16-10-2023			
6.	The Chinese remainder theorem	1	18-10-2023			
7.	Systems of linear congruences	2	25 & 26-10-2023			
<b>No. of classes required to complete UNIT – I: 8</b>				<b>No. of classes taken:8</b>		

#### **UNIT – II: Cloud Technologies and Eco-Systems Building Cloud Computing Environments:**

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
8.	Introduction to Linear Regression, The Simple Linear Regression Model	1	30-10-2023			
9.	Least Squares and the Fitted Model, Properties of the Least Squares Estimators, Inferences Concerning the Regression Coefficients	1	01-11-2023			
10.	Prediction, Simple Linear Regression Case Study Random Variables	1	02-11-2023			
11.	Probability Distributions: Concept of a Random Variable	1	06-11-2023			
12.	Discrete Probability Distributions	1	08-11-2023			
13.	Continuous Probability Distributions	2	09-11-2023 13-11-2023			
14.	Statistical Independence	1	15-11-2023			
15.	Discrete Probability Distributions: Binomial Distribution	1	16-11-2023			
16.	Poisson distribution.	1	20-11-2023			
<b>No. of classes required to complete UNIT – II: 10</b>				<b>No. of classes taken:10</b>		

**UNIT – III:**

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
17.	Normal Distribution, Areas under the Normal Curve	2	22-11-2023 & 23-11-2023			
18.	Applications of the Normal Distribution	1	24-11-2023			
19.	Normal Approximation to the Binomial	1	29-11-2023			
20.	Fundamental Sampling Distributions: Random Sampling	1	30-11-2023			
21.	Sampling Distributions, Sampling,	1	04-12-2023			
22.	Distribution of Means and the Central Limit Theorem	1	06-12-2023			
23.	Sampling Distribution of $S^2$	1	07-12-2023			
24.	t-Distribution, F Distribution.	1	11-12-2023			
<b>No. of classes required to complete UNIT – III: 09</b>				<b>No. of classes taken:09</b>		

**UNIT – IV: Cloud Management and Security Mechanisms Cloud Management Mechanisms:**

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
25.	Introduction, Statistical Inference, Classical Methods of Estimation	2	13-12-2023 & 14-12-2023			
26.	Estimating the Mean, Standard Error of a Point Estimate	1	18-12-2023			
27.	Prediction Intervals, Tolerance Limits, Estimating the Variance	1	20-12-2023			
28.	Estimating a Proportion for single mean, Difference between Two Means	1	21-12-2023			
29.	Between Two Proportions for Two Samples and Maximum Likelihood Estimation.	1	27-12-2023			
<b>No. of classes required to complete UNIT – IV: 06</b>				<b>No. of classes taken:06</b>		

**UNIT – V: Storage Systems:**

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
30.	Introduction to Stochastic processes- Markov process.	1	28-12-2023			
31.	Transition Probability, Transition Probability Matrix	1	03-01-2024			
32.	First order and Higher order Markov process	1	04-01-2024			
33.	n step transition probabilities, Markov chain	1	08-01-2024			
34.	Steady state condition, Markov analysis.	1	10-01-2024			
<b>No. of classes required to complete UNIT – V: 05</b>				<b>No. of classes taken:05</b>		

### Content Beyond the Syllabus:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
35	Markov analysis in spread sheets	1	11-01-2024			

Teaching Learning Methods			
TLM1	Chalk and Talk	TLM4	Demonstration (Lab/Field Visit)
TLM2	PPT	TLM5	ICT (NPTEL/SwayamPrabha/MOOCs)
TLM3	Tutorial	TLM6	Group Discussion/Project

## PART-C

### EVALUATION PROCESS (R23 Regulation):

Evaluation Task	Marks
I – Descriptive Examination (Units-I, II)	M1 = 30
II – Descriptive Examination (UNIT-III, IV & V)	M2 = 30
Report writing	RW=10
Mid Marks = 80% of Max ((M1), (M2)) + 20% of Min((M1), (M2))+RW	M+RW=40
Cumulative Internal Examination (CIE): M	40
Semester End Examination (SEE)	60
Total Marks = CIE + SEE	100

## **PART-D**

**PEO 1:** To inculcate the investigating and adaptability skills into the students to carryout research on recent trends in Computer Science and Engineering Technology.

**PEO2:** To empower the student with the qualities of effective communication, technical document writing, team work, lifelong learning attitude, and leadership needed for a successful career.

**PEO3:** Enlighten the students on analyzing engineering issues in a broader perspective with ethical responsibility towards sustainable development to satisfy the societal needs.

**PEO4:** Equip the students with all-round knowledge to adapt the evolving technical challenges and changing career opportunities in par with global competency.

### **PROGRAMME OUTCOMES (POs):**

<b>PO 1</b>	Independently carry out research /investigation and development work to solve practical problems.
<b>PO 2</b>	Write and present a substantial technical report / document.
<b>PO 3</b>	Demonstrate a degree of mastery over the area as per the specialization of the program.
<b>PO 4</b>	Design green energy systems to conserve and protect environment.
<b>PO 5</b>	Develop power electronic based controllers for electrical systems to improve their performance.
<b>PO 6</b>	Develop innovative and entrepreneurial solutions.

<b>Title</b>	<b>Course Instructor</b>	<b>Course Coordinator</b>	<b>Module Coordinator</b>	<b>Head of the Department</b>
<b>Name of the Faculty</b>	Dr.D.Venkata Subbaiah	Dr.D.Venkata Subbaiah		Dr. D. Veeraiah
<b>Signature</b>				



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[hodcse@lbrce.ac.in](mailto:hodcse@lbrce.ac.in), [cseoffice@lbrce.ac.in](mailto:cseoffice@lbrce.ac.in), Phone: 08659-222 933, Fax: 08659-222931

**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING**

## COURSE HANDOUT

### PART-A

Name of Course Instructor : G.V.Suresh  
Course Name & Code : 23DS07-Social Media Analytics  
L-T-P Structure : 3-0-0 Credits: 3  
Program/Sem/Sec : M.Tech./I A.Y.: 2023-24

**PRE-REQUISITE:** This course will introduce concepts and approaches to mining social media data. It focuses on obtaining and exploring data, mining networks, and mining text from social platforms. Students will learn how to apply previously learned data mining concepts to a domain that will likely be familiar to all of them: social media. Students will learn to explore, model, and predict with network and textual data from existing social platforms.

**COURSE OUTCOMES (COs):** At the end of the course, the student will be able to:

CO1:	Understanding characteristics and types of social media	Understand – Level 2
CO2:	Knowledge on layers of social media analytics	Understand – Level 2
CO3:	Apply text analysis tools on social media data	Apply-L3
CO4:	Understand the significance of action analytics	Understand – Level 2
CO5:	Detect viral topics on social media (YouTube)	Apply-L3

**COURSE ARTICULATION MATRIX (Correlation between COs, POs & PSOs):**

COs	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	-	-	-	-	1
CO2	3	1	-	-	2	-
CO3	3	1	-	-	2	-
CO4	3	1	1	1	-	1
CO5	3	-	-	-	1	0

### **TEXTBOOKS:**

1. Social Media Analytics: Techniques And Insights For Extracting Business Value Out Of Social Media By Matthew Ganis, Avinash Kohirkar, Pearson Education.
2. Social Media Analytics: Effective Tools for Building, Interpreting, and Using Metrics, Marshall Sponder, MGH.
3. Big Data And Analytics, Seema Acharya, Subhasinin Chellappan, Wiley Publications.
4. Big Data, Black Booktm , Dreamtech Press, 2015 Edition.

## PART-B

### COURSE DELIVERY PLAN (LESSON PLAN):

#### UNIT – I: Introduction To Social Media

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	World Wide Web, Web 1.0, Web 2.0, Web 3.0	1	05-10-2023			
2.	Social Media	1	10-10-2023			
3.	Core Characteristics Of Social Media	1	11-10-2023			
4.	Types Of Social Media	1	12-10-2023			
5.	Social Networking Sites	1	17-10-2023			
6.	Using Facebook For Business Purposes	1	18-10-2023			
7.	Content Communities	1	19-10-2023			
<b>No. of classes required to complete UNIT – I: 7</b>				<b>No. of classes taken:7</b>		

#### UNIT – II: Social Media Analytics Overview

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
9.	Purpose of Social Media Analytics	1	26-10-2023			
10.	Social Media Vs. Traditional Business Analytics,	1	31-10-2023			
11.	Seven Layers of Social Media Analytics	1	01-11-2023			
12.	Types Of Social Media Analytics	1	02-11-2023			
13.	Social Media Analytics Cycle	1	07-11-2023			
14.	Challenges To Social Media Analytics	2	08-11-2023 09-11-2023			
15.	Social Media Analytics Tools	1	14-11-2023			
16.	Case Study: The Underground Campaign That Scored Big	1	15-11-2023			
<b>No. of classes required to complete UNIT – II: 8</b>				<b>No. of classes taken:8</b>		

#### UNIT – III: Social Media Text Analytics

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
19.	Social Media Text Analytics	1	22-11-2023			
20.	Types of Social Media Text	1	23-11-2023			
21.	Purpose of Text Analytics	1	28-11-2023			
22.	Steps in Text Analytics	1	29-11-2023			
23.	Social Media Text Analysis Tools	1	30-11-2023			
24.	Case Study: Tapping Into Online Customer Opinions	1	06-12-2023			
<b>No. of classes required to complete UNIT – III: 06</b>				<b>No. of classes taken:06</b>		

#### UNIT – IV: Social Media Actions Analytics

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
28.	Social Media Actions Analytics	1	14-12-2023			

29.	Introduction To Actions Analytics	1	19-12-2023			
30.	Common Social Media Actions	1	20-12-2023			
31.	Actions Analytics Tools	1	21-12-2023			
32.	Case Study: Cover-More Group	1	26-12-2023			
<b>No. of classes required to complete UNIT – IV: 05</b>					<b>No. of classes taken:05</b>	

#### UNIT – V: Social Media Hyperlink Analytics

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
35.	Social Media Hyperlink Analytics	1	02-01-2024			
36.	Types Of Hyperlinks,	1	03-01-2024			
37.	Hyperlink Analytics	1	04-01-2024			
38.	Types Of Hyperlink Analytics	1	08-01-2024			
39.	Hyperlink Analytics Tools.	1	09-01-2024			
<b>No. of classes required to complete UNIT – V: 05</b>					<b>No. of classes taken:05</b>	

#### Content Beyond the Syllabus:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
40.	Case Study: Hyperlinks And Viral YouTube Videos	1	10-01-2024			
41.	Case Study: Hyperlinks And Viral Twitter.	1	11-01-2024			

#### Teaching Learning Methods

<b>TLM1</b>	Chalk and Talk	<b>TLM4</b>	Demonstration (Lab/Field Visit)
<b>TLM2</b>	PPT	<b>TLM5</b>	ICT (NPTEL/SwayamPrabha/MOOCs)
<b>TLM3</b>	Tutorial	<b>TLM6</b>	Group Discussion/Project

#### EVALUATION PROCESS (R20 Regulation):

Evaluation Task	Marks
I – Descriptive Examination (Units-I, II)	M1 = 30
II – Descriptive Examination (UNIT-III, IV & V)	M2 = 15
Report writing	RW=10
Mid Marks = 80% of Max ((M1), (M2)) + 20% of Min((M1), (M2))+RW	M+RW=40
<b>Cumulative Internal Examination (CIE): M</b>	40
<b>Semester End Examination (SEE)</b>	60
<b>Total Marks = CIE + SEE</b>	<b>100</b>



## PART-D

### PROGRAMME OUTCOMES (POs):

<b>PO1</b>	Independently carry out research/investigation and development work to solve practical problems.
<b>PO2</b>	Write and present a substantial technical report/document.
<b>PO3</b>	Demonstrate a degree of mastery over the area as per the specialization of the program. The mastery should be at a level higher than the requirements in the appropriate bachelor program.
<b>PO4</b>	Design and develop software projects given their specifications and within performance and cost constraints.
<b>PO5</b>	An ability to Work on multi-disciplinary projects and exhibit team skills to upgrade knowledge for adoption of current technological changes.
<b>PO6</b>	Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

<b>Title</b>	<b>Course Instructor</b>	<b>Course Coordinator</b>	<b>Module Coordinator</b>	<b>Head of the Department</b>
<b>Name of the Faculty</b>	G.V.Suresh	G.V.Suresh	Dr.D.VENKATA SUBBAIH	Dr. D. Veeraiah
<b>Signature</b>				



**LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING**  
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**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING**

**COURSE HANDOUT**

**PART-A**

Name of Course Instructor : Dr.D.Veeraiah  
Course Name & Code : CONSTITUTION OF INDIA (23AS05)  
L-T-P Structure : 2-0-0 Credits : 0  
Program/Sem/Sec : M.Tech., PE&ED, I-Sem., A A.Y: 2023-24

**PRE-REQUISITE: Understand the Indian Constitution**

**COURSE EDUCATIONAL OBJECTIVES (CEOs):**

- To enable the student to understand the importance of constitution
- To understand the structure of Executive ,Legislature and Judiciary.
- To Understand Philosophy of fundamental rights and duties.
- To Understand the autonomous nature of constitution bodies like Supreme Court and High Court Controller and Auditor General of India and Election Commission of India
- To Understand the Central and State relation, financial and administrative.

**COURSE OUTCOMES (COs):** At the end of the course, students are able to

<b>CO 1</b>	Understand history and philosophy of constitution with reference to preamble, Fundamental Rights and Duties.
<b>CO 2</b>	Understand the concept of Unitary and Federal Government along with the role of President, Prime Minister and Judicial System.
<b>CO 3</b>	Understand the structure of the state government, Secretariat, Governor and Chief Minister and their functions.
<b>CO 4</b>	Learn local administration viz. Panchayat, Block, Municipality and Corporation.
<b>CO 5</b>	Learn about Election Commission and the process and about SC,ST,OBC and women.

**COURSE ARTICULATION MATRIX(Correlation between , POs ):**

<b>COs</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>
<b>CO1</b>	-	-	-	-	-	3
<b>CO2</b>	-	-	-	-	-	3
<b>CO3</b>	-	-	-	-	-	3
<b>CO4</b>	-	-	-	-	-	3
<b>CO5</b>	-	-	-	-	-	3

**Note:** Enter Correlation Levels **1** or **2** or **3**. If there is no correlation, put '-'  
**1**- Slight (Low), **2** - Moderate (Medium), **3** - Substantial (High).

**TEXT BOOKS:**

- T1** Dr.B.R Ambedkar ,The Constitution of India ,General Press First edition 2020., New Delhi  
**T2** Dr.B.R Ambedkar ,The Constitution of India, Government of India

**REFERENCE BOOKS:**

- R1** Durga Das Basu, Introduction to the Constitution of India, Prentice – Hall of India Pvt.Ltd., New Delhi.  
**R2** Subash Kashyap, Indian Constitution, National Book Trust.  
**R3** J.A. Siwach, Dynamics of Indian Government and Politics.  
**R4** D.C. Gupta, Indian Government and Politics.  
**R5** H.M.Sreevai. Constitutional Law of India, 4th edition in 3 volumes (Universal Law Publication).  
**R6** J.C. Johari, Indian Government and Politics Hans.  
**R7** J.Raj, Indian Government and Politics.  
**R8** M.V. Pylee, Indian Constitution, Durga Das Basu, Human Rights in Constitutional Law, Prentice – Hall of India Pvt. Ltd., New Delhi.  
**R9** Noorani, A.G. (South Asia Human Rights Documentation Centre), Challenges to Civil Right). Challenges to Civil Rights Guarantees in India, Oxford University Press 2012.

**E RESOURCES**

1. [nptel.ac.in/courses/109104074/8](https://nptel.ac.in/courses/109104074/8).
2. [nptel.ac.in/courses/109104045](https://nptel.ac.in/courses/109104045).
3. [nptel.ac.in/courses/101104065](https://nptel.ac.in/courses/101104065).
4. [www.hss.iitb.ac.in/en/lecture-details](http://www.hss.iitb.ac.in/en/lecture-details).
5. [www.iitb.ac.in/en/event/2nd-lecture-institute-lecture-series-indianconstitution](http://www.iitb.ac.in/en/event/2nd-lecture-institute-lecture-series-indianconstitution).

**PART-B****COURSE DELIVERY PLAN (LESSON PLAN):****UNIT-I : Introduction to Indian Constitution**

S.No	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome Cos	Text Book followed	HOD Sign Weekly
1.	Introduction and Co-Po and Syllabus Constitution meaning and the term Sources and History of Indian Constitution	2	09-10-2023 & 10-10-2023		TLM2	CO1	T1 / T2	
2.	Features-Citizenship, Preamble Fundamental Rights and Duties Directive Principles of State Policy	2	16-10-2023 17-10-2023		TLM2	CO1	T1 / T2	
<b>No. of classes required to complete UNIT-I</b>		<b>2</b>			<b>No. of classes taken:</b>			

**UNIT-II: Union Government and its Administration Structure of the Indian Union**

S.No	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
3	Union Government structure in India Federalism Centre State Relationships to the Union President Role, Power and Position	2	30-10-2023 & 31-10-2023		TLM2	CO2	T1 / T2	
4	Prime Minister (PM) and Council of Ministers ,cabinet and Central Secretariat Powers and duties Lok Sabha, Rajya Sabha, Supreme Court and High Court Powers and Functions.	1	06-11-2023		TLM2	CO2	T1 / T2	
5	Assignment II	1	07-11-2023	TLM2	CO2		T1 / T2	
<b>I MID EXAMINATIONS: 27-11-2023 TO 01-12-2023</b>								

**UNIT-III: State Government and its administration Governor**

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
6	State Government and its Administration Governor and Role Role of Chief Ministers and Council of Ministers	2	13-11-2023 & 14-11-2023	04-12 2023	TLM2 / TLM4	CO3	T1 / T2	
7	State Secretariat Functions Organisation ,Structure and Functions of State Governments	1	27-11-2023	11-12-2023	TLM2 / TLM4 TLM2 / TLM4	CO3	T1 / T2	
<b>No. of classes required to complete UNIT-III</b>		<b>3</b>			<b>No. of classes taken:</b>			

### UNIT-IV: A Local Administration

S.No	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
8	A Local Administration Role and importance of local administration Municipalities –Mayor and Role of Elected Representative	2	28-11-2023 & 04-12-2023		TLM2 / TLM4	CO4	T1 / T2	
9	Functions of Panchayati Raj Institution,Zilla Panchayats ,Elected Official and their roles Village level-Role of Elected and Appointed officials./Assignment-IV	2	05-12-2023 & 11-12-2023		TLM2 / TLM4	CO4	T1 / T2	
<b>No. of classes required to complete UNIT-IV</b>		<b>4</b>			<b>No. of classes taken:</b>			

### UNIT-V: Election Commission

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
10	Election Commission :Role of Chief Election Commissioner and Election Commissionerate	2	12-12-2023 & 18-12-2023		TLM2 / TLM4	CO5	T1 / T2	
11	State Election Commission Functions and Commissions for the Welfare of SC/ST/OBC and Women.	2	19-12-2023 & 26-12-2023		TLM2 / TLM4	CO5	T1 / T2	
<b>No. of classes required to complete UNIT-V</b>		<b>4</b>			<b>No. of classes taken:</b>			

### Content Beyond the Syllabus

S.No	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
12	Consumer Rights Industrial policies	1	02-01-2024		TLM2/ TLM5		T2/R3	

Teaching Learning Methods			
<b>TLM1</b>	Chalk and Talk	<b>TLM4</b>	Demonstration (Lab/Field Visit)
<b>TLM2</b>	PPT	<b>TLM5</b>	ICT (NPTEL/Swayam Prabha/MOOCs)
<b>TLM3</b>	Tutorial	<b>TLM6</b>	Group Discussion/Project

<b>TLM 7</b>	Assignment /Quiz		
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## PART-C

### PROGRAMME OUTCOMES (POs):

<b>PO1</b>	Independently carry out research/investigation and development work to solve practical problems.
<b>PO2</b>	Write and present a substantial technical report/document.
<b>PO3</b>	Demonstrate a degree of mastery over the area as per the specialization of the program. The mastery should be at a level higher than the requirements in the appropriate bachelor program.
<b>PO4</b>	Design and develop software projects given their specifications and within performance and cost constraints.
<b>PO5</b>	An ability to Work on multi-disciplinary projects and exhibit team skills to upgrade knowledge for adoption of current technological changes.
<b>PO6</b>	Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
<b>Name of the Faculty</b>	Dr. D. Veeraiah			Dr. D. Veeraiah
<b>Signature</b>				





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(AUTONOMOUS)

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## DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

### COURSE HANDOUT

#### PART-A

**Name of Course Instructor:** Dr M Sitha Ram  
**Course Name & Code** : RESEARCH METHODOLOGY AND IPR– 23RM01  
**L-T-P Structure** : 2-0-0 **Credits:** 2  
**Program/Sem** : M.Tech/I **A.Y.:** 2023-24

Pre-requisites: Knowledge in Engineering, English

Course Objective: To understand the research problem, to know the literature studies, plagiarism and ethics, to get the knowledge about technical writing to analyse the nature of intellectual property rights and new developments and research related information and to know the patent rights.

Course Outcomes: After the completion of the course, students should be able to

**CO1** Analyze the research problem and its formulation.

**CO2** Analyze the significance of research ethics

**CO3** Apply the information technology for better tomorrow and to develop creativity.

**CO4** Identify the importance of intellectual property rights to be promoted among students in general & engineering in particular

**CO5** Describe the IPR protection for new and better products, and in turn brings about, economic growth and social benefits.

#### **TEXT BOOKS**

1. Stuart Melville and Wayne Goddard, "Research methodology: an introduction for science & engineering students"
2. Wayne Goddard and Stuart Melville, "Research Methodology: An Introduction"
3. Ranjit Kumar, 2nd Edition, "Research Methodology: A Step by Step Guide for beginners"

#### **REFERENCES**

1. Halbert, "Resisting Intellectual Property", Taylor & Francis Ltd ,2307.
2. Mayall, "Industrial Design", McGraw Hill, 1992.
3. Niebel, "Product Design", McGraw Hill, 1974.
4. Asimov, "Introduction to Design", Prentice Hall, 1962.
5. Robert P. Merges, Peter S. Menell, Mark A. Lemley, "Intellectual Property in New Technological Age", 2316.
6. T. Ramappa, "Intellectual Property Rights Under WTO", S. Chand, 2308



## PART-B

### COURSE DELIVERY PLAN (LESSON PLAN):

#### UNIT I- RESEARCH PROBLEM AND SCOPE FOR SOLUTION

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Meaning of research problem, Sources of research problem	1	05-10-2023		TLM2	
2.	Criteria Characteristics of a good research problem,	1	10-10-2023		TLM2	
3.	Errors in selecting a research problem	1	12-10-2023		TLM2	
4.	Scope and objectives of research problem	1	17-10-2023		TLM2	
5.	Approaches of investigation of solutions for research problem,	1	19-10-2023		TLM2	
6.	data collection	1	26-10-2023		TLM2	
7.	analysis, interpretation	1	30-10-2023		TLM2	
8.	Necessary instrumentations	1	31-10-2023		TLM2	
<b>No. of classes required to complete UNIT-I: 08</b>				<b>No. of classes taken:</b>		

#### UNIT II- FORMAT

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
9.	Effective literature studies Approaches,	1	02-11-2023		TLM2	
10.	analysis	1	06-11-2023		TLM2	
11.	Plagiarism,	1	07-11-2023		TLM2	
12.	Research ethics	1	07-11-2023		TLM2	
13.	Effective technical writing, how to write report	1	09-11-2023		TLM2	
14.	Paper Developing a Research Proposal	1	09-11-2023		TLM2	
15.	Format of research proposal	1	14-11-2023		TLM2	
16.	a presentation and assessment by a review committee	1	14-11-2023		TLM2	
<b>No. of classes required to complete UNIT-II: 08</b>				<b>No. of classes taken:</b>		

#### UNIT III- PROCESS AND DEVELOPMENT

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
17.	Nature of Intellectual Property	1	16-11-2023		TLM2	
18.	Patents, Designs	1	16-11-2023		TLM2	
19.	Trade and Copyright. Process of Patenting and Development	1	27-11-2023		TLM2	
20.	technological research, innovation	1	28-11-2023		TLM2	
21.	patenting, development	1	28-11-2023		TLM2	
22.	International Scenario	1	30-11-2023		TLM2	
23.	International cooperation on Intellectual Property. Procedure for grants of patents	1	04-12-2023		TLM2	
24.	patenting under PCT	1	07-12-2023		TLM2	
<b>No. of classes required to complete UNIT-III: 08</b>				<b>No. of classes taken:</b>		

### UNIT IV- PATENT RIGHTS

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
25.	Patent Rights:	1	11-12-2023		TLM2	
26.	Scope of Patent Rights	1	12-12-2023		TLM2	
27.	Licensing and transfer of technology	1	14-12-2023		TLM2	
28.	Patent information	1	18-12-2023		TLM2	
29.	databases	1	19-12-2023		TLM2	
30.	Geographical Indications	1	21-12-2023		TLM2	
<b>No. of classes required to complete UNIT-IV: 06</b>				<b>No. of classes taken:</b>		

### UNIT V- NEW DEVELOPMENTS IN IPR

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
31.	New Developments in IPR	1	26-12-2023		TLM2	
32.	Administration of Patent System	1	28-12-2023		TLM2	
33.	IPR of Biological Systems	1	02-01-2024		TLM2	
34.	Computer Software etc	1	04-01-2024		TLM2	
35.	Traditional knowledge Case Studies	1	08-01-2024		TLM2	
36.	IPR and IITs.	1	09-01-2024		TLM2	
37.	Discussion about SEE paper	1	11-01-2024		TLM2	
<b>No. of classes required to complete UNIT-V: 07</b>				<b>No. of classes taken:</b>		

Teaching Learning Methods			
<b>TLM1</b>	Chalk and Talk	<b>TLM4</b>	Demonstration (Lab/Field Visit)
<b>TLM2</b>	PPT	<b>TLM5</b>	ICT (NPTEL/Swayam Prabha/MOOCs)
<b>TLM3</b>	Tutorial	<b>TLM6</b>	Group Discussion/Project

### PART-C

#### EVALUATION PROCESS (R20 Regulation):

Evaluation Task	Marks
I-Descriptive Examination (Units-I, II & UNIT-III (Half of the Syllabus))	M1=30
II- Descriptive Examination (UNIT-III (Remaining Half of the Syllabus), IV & V)	M2=30
Mid Marks =80% of Max ((M1), (M2)) + 20% of Min ((M1), (M2))	M=30
Report Writing & Presentation	R=10
Cumulative Internal Examination (CIE): M+R	40
Semester End Examination (SEE)	60
Total Marks = CIE + SEE	100

## PART-D

### PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

<b>PEO 1</b>	To inculcate the investigating and adaptability skills into the students to carryout research on recent trends in Computer Science and Engineering Technology.
<b>PEO 2</b>	To empower the student with the qualities of effective communication, technical document writing, team work, lifelong learning attitude, and leadership needed for a successful career.
<b>PEO 3</b>	Enlighten the students on analyzing engineering issues in a broader perspective with ethical responsibility towards sustainable development to satisfy the societal needs.
<b>PEO 4</b>	Equip the students with all-round knowledge to adapt the evolving technical challenges and changing career opportunities in par with global competency.

### PROGRAMME OUTCOMES (POs):

<b>PO 1</b>	Independently carry out research/investigation and development work to solve practical problems.
<b>PO 2</b>	Write and present a substantial technical report/document.
<b>PO 3</b>	Demonstrate a degree of mastery over the area as per the specialization of the program. The mastery should be at a level higher than the requirements in the appropriate bachelor program.
<b>PO 4</b>	Design and develop software projects given their specifications and within performance and cost constraints.
<b>PO 5</b>	An ability to Work on multi-disciplinary projects and exhibit team skills to upgrade knowledge for adoption of current technological changes.
<b>PO 6</b>	Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

<b>Title</b>	<b>Course Instructor</b>	<b>Course Coordinator</b>	<b>Module Coordinator</b>	<b>Head of the Department</b>
<b>Name of the Faculty</b>	<b>Dr M Sitha Ram</b>	<b>Dr M Sitha Ram</b>	<b>Dr.B Poornaiah</b>	<b>Dr D Veeraiah</b>
<b>Signature</b>				