



**REFERENCE BOOKS:**

<b>R1</b>	Artificial Neural Networks, Yegnanarayana, B., PHI Learning Pvt. Ltd, 2009
<b>R2</b>	Matrix Computations, Golub, G.,H., and Van Loan,C.,F, JHU Press,2013.
<b>R3</b>	Neural Networks: A Classroom Approach, Satish Kumar, Tata McGraw-HillEducation, 2004.

**PART-B****COURSE DELIVERY PLAN (LESSON PLAN):****UNIT-I: Mathematical foundations of 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
1.	Mathematical foundations of Deep Learning	1	24-06-24		TLM1,2	
2.	Multiplying Matrices and Vectors	2	25-06-24 27-06-24		TLM1,2	
3.	Identity and Inverse Matrices	1	28-06-24		TLM1,2	
4.	Linear dependence and span	2	01-07-24 02-07-24		TLM1,2	
5.	Norms	2	04-07-24 05-07-24		TLM1,2	
6.	Special kinds of matrices and vectors	1	08-07-24		TLM1,2	
7	Trace operations	1	09-07-24		TLM1,2	
8	Eigen Decomposition	2	11-07-24 12-07-24		TLM1,2	
<b>No. of classes required to complete UNIT-I: 12</b>				<b>No. of classes taken:</b>		

**UNIT-II: Fundamentals of 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
9.	Anatomy of Neural Networks: Layers, Models, Loss functions and optimizers	5	15-07-24 16-07-24 18-07-24 19-07-24 22-07-24		TLM1,2	
10.	Training Deep Networks: Cost Functions, Optimizers	5	23-07-24 25-07-24 26-07-24 29-07-24 30-07-24		TLM1,2	
11.	Types of Deep Neural Networks	4	01-08-24 02-08-24 05-08-24 06-08-24		TLM1,2	
<b>No. of classes required to complete UNIT-II: 14</b>				<b>No. of classes taken:</b>		

**UNIT-III: Convolutional Neural Networks**

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
12.	Motivation	1	08-08-24		TLM1,2	
13.	Convolution Operation	2	09-08-24 12-08-24		TLM1,2	
14.	Types of layers	4	13-08-24 16-08-24 19-08-24 20-08-24		TLM1,2	
15.	Pooling	3	22-08-24 23-08-24 27-08-24		TLM1,2	
16.	LENET5 Architecture	3	29-08-24 30-08-24 09-09-24		TLM1,2	
<b>No. of classes required to complete UNIT-III: 13</b>				<b>No. of classes taken:</b>		

**UNIT-IV: Recurrent Neural Networks**

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.	Architecture of traditional RNN	2	10-09-24 12-09-24		TLM1,2	
18.	Types and applications of RNN	4	13-09-24 16-09-24 17-09-24 19-09-24		TLM1,2	
19.	Variants of RNNs	3	20-09-24 22-09-24 23-09-24		TLM1,2	
20.	Word Embedding using Word2vec	4	24-09-24 26-09-24 27-09-24 30-09-24		TLM1,2	
<b>No. of classes required to complete UNIT-IV: 13</b>				<b>No. of classes taken:</b>		

**UNIT-V: Cluster Analysis**

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
21.	Introduction to Regularization for Deep Learning	1	01-10-24		TLM1,2	
22.	L1 and L2 Regularizations	2	03-10-24 04-10-24		TLM1,2	
23.	Dropout	1	07-10-24		TLM1,2	

24.	Data Augmentation and Early Stopping	2	08-10-24 10-10-24		TLM1,2	
25.	Case study on MNIST data	3	14-10-24 15-10-24 17-10-24		TLM1,2	
26	Introduction to Auto encoders	1	18-10-24		TLM1,2	
27	Architecture and Implementation	2	21-10-24 22-10-24		TLM1,2	
28	Denoising Auto encoders	1	24-10-24		TLM1,2	
29	Sparse Auto encoders	1	25-10-24		TLM1,2	
30	Use cases	1	28-10-24		TLM1,2	
31	Projects and evaluation	3	29-10-24 01-11-24 04-11-24		TLM1,2	
<b>No. of classes required to complete UNIT-V: 18</b>				<b>No. of classes taken:</b>		

### Contents 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
32.	GAN (Generative Adversarial Network)	3	05-11-2024 07-11-2024 08-11-2024		TLM2	

### 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:

Evaluation Task	Marks
Assignment-I (Units-I, II & UNIT-III (Half of the Syllabus))	A1=5
I-Descriptive Examination (Units-I, II & UNIT-III (Half of the Syllabus))	M1=15
I-Quiz Examination (Units-I, II & UNIT-III (Half of the Syllabus))	Q1=10
Assignment-II (Unit-III (Remaining Half of the Syllabus), IV & V)	A2=5
II- Descriptive Examination (UNIT-III (Remaining Half of the Syllabus), IV & V)	M2=15
II-Quiz Examination (UNIT-III (Remaining Half of the Syllabus), IV & V)	Q2=10
<b>Mid Marks =80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))</b>	<b>M=30</b>
<b>Cumulative Internal Examination (CIE): M</b>	<b>30</b>
<b>Semester End Examination (SEE)</b>	<b>70</b>
<b>Total Marks = CIE + SEE</b>	<b>100</b>

**ACADEMIC CALENDAR:**

Description	From	To	Weeks
Commencement of Class Work	03-07-2023		
I Phase of Instructions	03-07-2023	26-08-2023	8W
I Mid Examinations	28-08-2023	02-09-2023	1W
II Phase of Instructions	04-09-2023	28-10-2023	8W
II Mid Examinations	30-10-2023	04-11-2023	1W
Preparation and Practical's	06-11-2023	11-11-2023	1W
Semester End Examinations	13-11-2023	25-11-2023	2W

**PART-D****PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):**

- PEO 1** Pursue a successful career in the area of Information Technology or its allied fields.
- PEO 2** Exhibit sound knowledge in the fundamentals of Information Technology and apply practical experience with programming techniques to solve real world problems.
- PEO 3** Able to demonstrate self-learning, life-long learning and work in teams on multidisciplinary projects.
- PEO 4** Able to understand the professional code of ethics and demonstrate ethical behavior, effective communication and team work and leadership skills in their job.

**PROGRAMME OUTCOMES (POs):**

- PO1** Engineering knowledge: Apply the knowledge of mathematics, science, engineering Fundamentals and an engineering specialization to the solution of complex engineering problems.
- PO2** Problem analysis: Identify, formulate, review research literature, and analyze complex Engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- PO3** Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- PO4** Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
- PO5** Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
- PO6** The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
- PO7** Environment and sustainability: Understand the impact of the professional engineering solution sin societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

- PO8** Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
- PO9** Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
- PO10** Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
- PO11** Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
- PO12** Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

**PROGRAMME SPECIFIC OUTCOMES (PSOs):**

<b>PSO 1</b>	Organize, Analyze and Interpret the data to extract meaningful conclusions.
<b>PSO 2</b>	Design, Implement and Evaluate a computer-based system to meet desired needs.
<b>PSO 3</b>	Develop IT application services with the help of different current engineering tools.

<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>Mr.V.V.Krishna Reddy</b>	<b>Mr.K.Rajasekhar</b>	<b>Mrs.M.Hemalatha</b>	<b>Dr. B.Srinivasa Rao</b>
<b>Signature</b>				



**REFERENCE BOOKS:**

<b>R1</b>	Artificial Neural Networks, Yegnanarayana, B., PHI Learning Pvt. Ltd, 2009
<b>R2</b>	Matrix Computations, Golub, G.,H., and Van Loan,C.,F, JHU Press,2013.
<b>R3</b>	Neural Networks: A Classroom Approach, Satish Kumar, Tata McGraw-HillEducation, 2004.

**PART-B****COURSE DELIVERY PLAN (LESSON PLAN):****UNIT-I: Mathematical foundations of 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
1.	Mathematical foundations of Deep Learning	1	24-06-24		TLM 1	
2.	Multiplying Matrices and Vectors	2	25-06-24 26-06-24		TLM 3	
3.	Identity and Inverse Matrices	1	27-06-24		TLM 1	
4.	Linear dependence and span	2	01-07-24 02-07-24		TLM 1	
5.	Norms	2	03-07-24 04-06-24		TLM 1	
6.	Special kinds of matrices and vectors	1	08-07-24		TLM 1	
7	Trace operations	1	09-07-24		TLM 1	
8	Eigen Decomposition	2	10-07-24 11-07-24		TLM 1	
<b>No. of classes required to complete UNIT-I: 12</b>				<b>No. of classes taken:</b>		

**UNIT-II: Fundamentals of 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
7.	Anatomy of Neural Networks: Layers, Models, Loss functions and optimizers	5	15-07-24 16-07-24 18-07-24 22-07-24 23-07-24		TLM 2	
8.	Training Deep Networks: Cost Functions, Optimizers	5	24-07-24 25-07-24 29-07-24 30-07-24 31-07-24		TLM 2	
9.	Types of Deep Neural Networks	4	01-08-24 05-08-24 06-08-24 07-08-24		TLM 3	
<b>No. of classes required to complete UNIT-II: 14</b>				<b>No. of classes taken:</b>		



**UNIT-III: Convolutional Neural Networks**

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
10	Motivation	1	08-08-24		TLM 1	
11	Convolution Operation	1	12-08-24 13-08-24		TLM 2	
12	Types of layers	3	14-08-24 19-08-24 20-08-24		TLM 2	
13	Pooling	3	21-08-24 22-08-24 27-08-24		TLM 2	
14	LENET5 Architecture	2	28-08-24 29-08-24		TLM 2	
<b>No. of classes required to complete UNIT-III: 10</b>				<b>No. of classes taken:</b>		

**UNIT-IV: Recurrent Neural Networks**

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
15	Architecture of traditional RNN	2	09-09-24 10-09-24		TLM 2	
16	Types and applications of RNN	4	11-09-24 12-09-24 17-09-24 18-09-24		TLM 5	
17	Variants of RNNs	3	19-09-24 23-09-24 24-09-24		TLM 3	
18	Word Embedding using Word2vec	4	25-09-24 26-09-24 30-09-24 01-10-24		TLM 1	
<b>No. of classes required to complete UNIT-IV: 13</b>				<b>No. of classes taken:</b>		

**UNIT-V: Cluster Analysis**

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	Introduction to Regularization for Deep Learning	1	03-10-24		TLM 2	
20	L1 and L2 Regularizations	2	07-10-24 08-10-24		TLM 2	
21	Dropout	1	14-10-24		TLM 2	
22	Data Augmentation and Early Stopping	2	15-10-24 16-10-24		TLM 2	

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23	Case study on MNIST data	1	17-10-24		TLM 4
24	Introduction to Auto encoders	1	21-10-24		TLM 2
25	Architecture and Implementation	1	22-10-24 23-10-24		TLM 4
26	Denoising Auto encoders	1	24-10-24 28-10-24		TLM 3
27	Sparse Auto encoders	1	29-10-24		TLM 3
28	Use cases	1	30-10-24		TLM 4
29	Projects and evaluation	1	04-11-24		TLM 6
<b>No. of classes required to complete UNIT-V: 15</b>				<b>No. of classes taken:</b>	

#### Contents 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
30.	GAN (Generative Adversarial Network)	1	05-11-2024 06-11-2024		TLM2	

#### 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:

Evaluation Task	Marks
Assignment-I (Units-I, II & UNIT-III (Half of the Syllabus))	A1=5
I-Descriptive Examination (Units-I, II & UNIT-III (Half of the Syllabus))	M1=15
I-Quiz Examination (Units-I, II & UNIT-III (Half of the Syllabus))	Q1=10
Assignment-II (Unit-III (Remaining Half of the Syllabus), IV & V)	A2=5
II- Descriptive Examination (UNIT-III (Remaining Half of the Syllabus), IV & V)	M2=15
II-Quiz Examination (UNIT-III (Remaining Half of the Syllabus), IV & V)	Q2=10
Mid Marks =80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE): M	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

## ACADEMIC CALENDAR:

Description	From	To	Weeks
Commencement of Class Work	03-07-2024		
I Phase of Instructions	24-06-2024	31-08-2024	8W
I Mid Examinations	02-09-2024	07-09-2024	1W
II Phase of Instructions	09-09-2024	09-11-2024	8W
II Mid Examinations	11-11-2024	16-11-2024	1W
Preparation and Practical's	18-11-2024	23-11-2024	1W
Semester End Examinations	25-11-2024	07-12-2024	2W

### PART-D

#### PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):

- PEO 1** Pursue a successful career in the area of Information Technology or its allied fields.
- PEO 2** Exhibit sound knowledge in the fundamentals of Information Technology and apply practical experience with programming techniques to solve real world problems.
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#### PROGRAMME OUTCOMES (POs):

- PO1** Engineering knowledge: Apply the knowledge of mathematics, science, engineering Fundamentals and an engineering specialization to the solution of complex engineering problems.
- PO2** Problem analysis: Identify, formulate, review research literature, and analyze complex Engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
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- PO4** Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
- PO5** Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
- PO6** The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

- PO7** Environment and sustainability: Understand the impact of the professional engineering solution in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
- PO8** Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
- PO9** Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
- PO10** Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
- PO11** Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
- PO12** Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

**PROGRAMME SPECIFIC OUTCOMES (PSOs):**

<b>PSO 1</b>	Organize, Analyze and Interpret the data to extract meaningful conclusions.
<b>PSO 2</b>	Design, Implement and Evaluate a computer-based system to meet desired needs.
<b>PSO 3</b>	Develop IT application services with the help of different current engineering tools.

<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>Mr.K.Rajasekhar</b>	<b>Mr.K.Rajasekhar</b>	<b>Mrs.M.Hemalatha</b>	<b>Dr. B.Srinivasa Rao</b>
<b>Signature</b>				



# LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)

Accredited by NAAC & NBA (Under Tier - I), ISO 9001:2015 Certified Institution

Approved by AICTE, New Delhi and Affiliated to JNTUK, Kakinada

L.B. REDDY NAGAR, MYLAVARAM, KRISHNA DIST., A.P.-521 230.

**DEPARTMENT OF INFORMATION TECHNOLOGY**

## COURSE HANDOUT

### PART-A

**Name of Course Instructor:** K.RAVITEJA

**Course Name & Code** : SOFT COMPUTING & 20CS26

**L-T-P Structure** : 3-0-0

**Program/Sem/Sec** : B.Tech/VII/A

**Credits:** 3

**A.Y.:** 2024-25

**PREREQUISITE:** Linear Algebra and Python

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

The objective of the course is to make students learn the frameworks of deep learning and their application

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

<b>CO1</b>	Describe the preliminaries of Artificial intelligence and Neural networks. (Understand - L2)
<b>CO2</b>	Map the issues to AI-based solutions. (Apply - L3)
<b>CO3</b>	Apply Soft computing techniques to solve real world problems. (Apply – L3)
<b>CO4</b>	Implement systems based on fuzzy logic. (Apply – L3)
<b>CO5</b>	Use Genetic algorithms to develop evolutionary approaches for solving real-world problems. (Apply – L3)

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

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
<b>CO1</b>	2	-	-	2	-	-	-	-	-	-	-	-	-	2	-
<b>CO2</b>	3	2	-	2	-	-	-	-	-	-	-	-	1	2	-
<b>CO3</b>	2	3	2	2	-	-	-	-	-	-	-	-	-	2	-
<b>CO4</b>	2	2	-	2	-	-	-	-	-	-	-	-	2	2	-
<b>CO5</b>	2	2	2	2	-	-	-	-	-	-	-	-	2	2	-
		1 - Low			2 -Medium				3 - High						

#### **TEXTBOOKS:**

1. Timothy J. Ross, “Fuzzy Logic with Engineering Applications”, John Wiley & Sons,3rd Edition 2010.
2. S, Rajasekaran& G.A. Vijayalakshmi Pai, “Neural Networks, Fuzzy Logic & Genetic Algorithms, Synthesis & applications”, PHI Publication, 1st Edition, 2009.
3. David E. Goldberg, "Genetic Algorithms", Pearson Education India, 2006.

#### **REFERENCE BOOKS:**

<b>R1</b>	Laurene Fauseett, "Fundamentals of Neural Networks", Prentice Hall India, New Delhi, 1994.
<b>R2</b>	B. Yagna Narayana, "Artificial Neural Networks", PHI, 3rd Edition, 2009
<b>R3</b>	Simon O. Haykin, "Neural Networks and Learning Machines", Prentice Hall, 3rd Edition, 2009.
<b>R4</b>	<a href="https://pypi.org/project/fuzzywuzzy/">https://pypi.org/project/fuzzywuzzy/</a>

## PART-B

### COURSE DELIVERY PLAN (LESSON PLAN):

#### UNIT-I: Introduction & Architecture:

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	1	24/6/24		TLM2	
2.	Architecture: Neuron, Nerve structure and synapse	1	25/6/24		TLM2	
3.	Artificial Neuron and its model	1	26/6/24		TLM2	
4.	activation functions	2	29/6/24 01/7/24		TLM1	
5.	Neural network architecture: single layer and multi-layer feed forward networks,	1	02/7/24		TLM1	
6.	recurrent networks	1	03/7/24		TLM1	
7.	Various learning techniques; perception rule	1	06/7/24		TLM1	
8.	convergence rule	1	08/7/24		TLM1	
9.	Associative Memory	1	09/7/24		TLM2	
10.	Auto-associative	1	10/7/24		TLM2	
11.	Hetero-associative memory.	1	15/7/24		TLM1	
12.	Derivative of Activation Functions.	2	16/7/24 20/7/24		TLM1	
13.	Numericals on Activation Functions.	2	22/7/24 23/7/24		TLM1	
14.	Numericals on Neural Networks.	1	24/7/24		TLM1	
<b>No. of classes required to complete UNIT-I: 17</b>				<b>No. of classes taken:</b>		

#### UNIT-II:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
15.	Perceptron model, solution.	1	27/7/24		TLM1	
16.	single layer artificial neural network,	1	29/7/24		TLM1	
17.	multi-layer perception model	1	30/7/24		TLM1	
18.	back propagation learning methods	2	31/7/24 03/8/24		TLM1	
19.	effect of learning rule co-efficient	1	05/8/24		TLM1	
20.	back propagation algorithm,	2	06/8/24 07/8/24		TLM1	
21.	factors affecting back propagation training	1	12/8/24		TLM1	
22.	applications	1	13/8/24		TLM2	

23.	Numericals on back propagation algorithm	2	14/8/24 17/8/24		TLM1	
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**No. of classes required to complete UNIT-II: 12**

**No. of classes taken:**

**UNIT-III: Fuzzy Logic-I**

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
24.	Basic concepts of fuzzy logic	2	19/8/24 20/8/24		TLM1	
25.	Fuzzy sets and Crisp sets	2	21/8/24 24/8/24		TLM1	
26.	Fuzzy set theory	1	27/8/24		TLM1	
27.	operations	1	28/8/24		TLM1	
28.	Properties of fuzzy sets	2	31/8/24 09/9/24		TLM1	
29.	Fuzzy and Crisp relations	2	10/9/24 11/9/24		TLM1	
30.	Fuzzy to Crisp conversion	1	17/9/24		TLM1	
31.	Fuzzy relations	2	18/9/24 21/9/24		TLM1	
32.	rules, propositions	2	23/9/24 24/9/24		TLM1	
33.	implications, and inferences	1	25/9/24		TLM1	
34.	Defuzzification techniques.	1	28/9/24		TLM1	
35.	applications of Fuzzy logic	1	30/9/24		TLM1	
<b>No. of classes required to complete UNIT-III:18</b>				<b>No. of classes taken:</b>		

**UNIT-IV: Fuzzy Logic – II**

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
36.	Membership functions	1	01/10/24		TLM1	
37.	interference in fuzzy logic	1	05/10/24		TLM1	
38.	fuzzy if-then rules	1	07/10/24		TLM1	
39.	Fuzzy implications and Fuzzy algorithms	1	08/10/24		TLM1	
40.	Fuzzifications & Defuzzification.	1	09/10/24		TLM1	
41.	Fuzzywuzzy Python library	1	14/10/24		TLM1	
42.	String Pattern Matching using Levenstein Algorithm	1	15/10/24		TLM1	
<b>No. of classes required to complete UNIT-IV: 09</b>				<b>No. of classes taken:</b>		

**UNIT-V: Genetic Algorithms and Genetic Operators.**

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
43.	Concept of "Genetics" and "Evolution"	1	16/10/24		TLM1	
44.	application to probabilistic search techniques	1	19/10/24		TLM2	
45.	Basic GA framework	1	21/10/24		TLM2	
46.	different GA architectures	2	22/10/24 23/10/24		TLM2	
47.	Encoding	1	26/10/24		TLM2	
48.	Crossover	1	28/10/24		TLM2	
49.	Selection	1	29/10/24		TLM2	
50.	Mutation	1	30/10/24		TLM2	
51.	Solving single-objective optimization problems using GAs	2	02/11/24 04/11/24		TLM2	
<b>No. of classes required to complete UNIT-V: 12</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	HOD Sign Weekly
1.	Nature Inspired Algorithms	1	05/11/24		TLM2	
2.	Use case on neural networks.	1	06/11/24		TLM2	

**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****PEVALUATION PROCESS (R20 Regulation):**

Evaluation Task	Marks
Assignment-I (Units-I, II & UNIT-III (Half of the Syllabus))	A1=5
I-Descriptive Examination (Units-I, II & UNIT-III (Half of the Syllabus))	M1=15
I-Quiz Examination (Units-I, II & UNIT-III (Half of the Syllabus))	Q1=10
Assignment-II (Unit-III (Remaining Half of the Syllabus), IV & V)	A2=5
II- Descriptive Examination (UNIT-III (Remaining Half of the Syllabus), IV & V)	M2=15
II-Quiz Examination (UNIT-III (Remaining Half of the Syllabus), IV & V)	Q2=10



Mid Marks =80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE): M	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

## PART-D

### PROGRAMME OUTCOMES (POs):

PO 1	<b>Engineering knowledge:</b> Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	<b>Problem analysis:</b> Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	<b>Design/development of solutions:</b> Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	<b>Conduct investigations of complex problems:</b> Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	<b>Modern tool usage:</b> Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
PO 6	<b>The engineer and society:</b> Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO 7	<b>Environment and sustainability:</b> Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	<b>Ethics:</b> Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	<b>Individual and team work:</b> Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	<b>Communication:</b> Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	<b>Project management and finance:</b> Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	<b>Life-long learning:</b> Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

**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>	<b>Mr K.Raviteja</b>	<b>Mr K.Raviteja</b>	<b>Mrs M.Hemalatha</b>	<b>Dr.B.Srinivasa Rao</b>
<b>Signature</b>				



# LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)

Accredited by NAAC & NBA (Under Tier - I), ISO 9001:2015 Certified Institution

Approved by AICTE, New Delhi and Affiliated to JNTUK, Kakinada

L.B. REDDY NAGAR, MYLAVARAM, KRISHNA DIST., A.P.-521 230.

**DEPARTMENT OF INFORMATION TECHNOLOGY**

## COURSE HANDOUT

### PART-A

**Name of Course Instructor:** K.RAVITEJA

**Course Name & Code** : SOFT COMPUTING & 20CS26

**L-T-P Structure** : 3-0-0

**Program/Sem/Sec** : B.Tech/VII/B

**Credits:** 3

**A.Y.:** 2024-25

**PREREQUISITE:** Linear Algebra , Set theory and Python

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

The objective of the course is to make students learn the frameworks of deep learning and their application

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

<b>CO1</b>	Describe the preliminaries of Artificial intelligence and Neural networks. (Understand - L2)
<b>CO2</b>	Map the issues to AI-based solutions. (Apply - L3)
<b>CO3</b>	Apply Soft computing techniques to solve real world problems. (Apply – L3)
<b>CO4</b>	Implement systems based on fuzzy logic. (Apply – L3)
<b>CO5</b>	Use Genetic algorithms to develop evolutionary approaches for solving real-world problems. (Apply – L3)

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

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
<b>CO1</b>	2	-	-	2	-	-	-	-	-	-	-	-	-	2	-
<b>CO2</b>	3	2	-	2	-	-	-	-	-	-	-	-	1	2	-
<b>CO3</b>	2	3	2	2	-	-	-	-	-	-	-	-	-	2	-
<b>CO4</b>	2	2	-	2	-	-	-	-	-	-	-	-	2	2	-
<b>CO5</b>	2	2	2	2	-	-	-	-	-	-	-	-	2	2	-
		1 - Low			2 -Medium				3 - High						

#### **TEXTBOOKS:**

1. Timothy J. Ross, “Fuzzy Logic with Engineering Applications”, John Wiley & Sons,3rd Edition 2010.
2. S, Rajasekaran& G.A. Vijayalakshmi Pai, “Neural Networks, Fuzzy Logic & Genetic Algorithms, Synthesis & applications”, PHI Publication, 1st Edition, 2009.
3. David E. Goldberg, "Genetic Algorithms", Pearson Education India, 2006.

#### **REFERENCE BOOKS:**

<b>R1</b>	Laurene Fauseett, "Fundamentals of Neural Networks", Prentice Hall India, New Delhi, 1994.
<b>R2</b>	B. Yagna Narayana, "Artificial Neural Networks", PHI, 3rd Edition, 2009
<b>R3</b>	Simon O. Haykin, "Neural Networks and Learning Machines", Prentice Hall, 3rd Edition, 2009.
<b>R4</b>	<a href="https://pypi.org/project/fuzzywuzzy/">https://pypi.org/project/fuzzywuzzy/</a>

## PART-B

### COURSE DELIVERY PLAN (LESSON PLAN):

#### UNIT-I: Introduction & Architecture:

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	1	24/6/24		TLM2	
2.	Architecture: Neuron, Nerve structure and synapse	1	25/6/24		TLM2	
3.	Artificial Neuron and its model	1	27/6/24		TLM2	
4.	activation functions	2	28/6/24 01/7/24		TLM1	
5.	Neural network architecture: single layer and multi-layer feed forward networks,	1	02/7/24		TLM1	
6.	recurrent networks	1	04/7/24		TLM1	
7.	Various learning techniques; perception rule	1	05/7/24		TLM1	
8.	convergence rule	1	08/7/24		TLM1	
9.	Associative Memory	1	09/7/24		TLM2	
10.	Auto-associative	1	11/7/24		TLM2	
11.	Hetero-associative memory.	1	12/7/24		TLM1	
12.	Derivative of Activation Functions.	2	15/7/24 16/7/24		TLM1	
13.	Numericals on Activation Functions.	2	18/7/24 19/7/24		TLM1	
14.	Numericals on Neural Networks.	1	22/7/24		TLM1	
<b>No. of classes required to complete UNIT-I: 17</b>				<b>No. of classes taken:</b>		

#### UNIT-II:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
15.	Perceptron model, solution.	1	23/7/24		TLM1	
16.	single layer artificial neural network,	1	25/7/24		TLM1	
17.	multi-layer perception model	1	26/7/24		TLM1	
18.	back propagation learning methods	2	29/7/24 30/7/24		TLM1	
19.	effect of learning rule co-efficient	2	01/8/24 02/8/24		TLM1	
20.	back propagation algorithm,	2	05/8/24 06/8/24		TLM1	
21.	factors affecting back propagation training	1	08/8/24		TLM1	
22.	applications	1	09/8/24		TLM2	

23.	Numericals on back propagation algorithm	2	12/8/24 13/8/24		TLM1	
<b>No. of classes required to complete UNIT-II: 12</b>				<b>No. of classes taken:</b>		

### UNIT-III: Fuzzy Logic-I

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
24.	Basic concepts of fuzzy logic	2	16/8/24 19/8/24		TLM1	
25.	Fuzzy sets and Crisp sets	2	20/8/24 22/8/24		TLM1	
26.	Fuzzy set theory	1	23/8/24		TLM1	
27.	operations	1	27/8/24		TLM1	
28.	Properties of fuzzy sets	2	29/8/24 30/8/24		TLM1	
29.	Fuzzy and Crisp relations	2	09/9/24 10/9/24		TLM1	
30.	Fuzzy to Crisp conversion	1	12/9/24		TLM1	
31.	Fuzzy relations	2	13/9/24 17/9/24		TLM1	
32.	rules, propositions	2	23/9/24 24/9/24		TLM1	
33.	implications, and inferences	1	26/9/24		TLM1	
34.	Defuzzification techniques.	1	27/9/24		TLM1	
35.	applications of Fuzzy logic	1	30/9/24		TLM1	
<b>No. of classes required to complete UNIT-III:18</b>				<b>No. of classes taken:</b>		

### UNIT-IV: Fuzzy Logic – II

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
36.	Membership functions	1	01/10/24		TLM1	
37.	interference in fuzzy logic	1	03/10/24		TLM1	
38.	fuzzy if-then rules	1	04/10/24		TLM1	
39.	Fuzzy implications and Fuzzy algorithms	1	07/10/24		TLM1	
40.	Fuzzifications & Defuzzification.	1	08/10/24		TLM1	
41.	Fuzzywuzzy Python library	1	10/10/24		TLM1	
42.	String Pattern Matching using Levenstein Algorithm	1	11/10/24		TLM1	
<b>No. of classes required to complete UNIT-IV: 09</b>				<b>No. of classes taken:</b>		

**UNIT-V: Genetic Algorithms and Genetic Operators.**

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
43.	Concept of "Genetics" and "Evolution"	1	14/10/24		TLM1	
44.	application to probabilistic search techniques	1	15/10/24		TLM2	
45.	Basic GA framework	2	17/10/24 18/10/24		TLM2	
46.	different GA architectures	2	21/10/24 22/10/24		TLM2	
47.	Encoding	1	24/10/24		TLM2	
48.	Crossover	1	25/10/24		TLM2	
49.	Selection	1	28/10/24		TLM2	
50.	Mutation	1	29/10/24		TLM2	
51.	Solving single-objective optimization problems using GAs	2	01/11/24 04/11/24		TLM2	
<b>No. of classes required to complete UNIT-V: 12</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	HOD Sign Weekly
1.	Nature Inspired Algorithms	1	05/11/24 07/11/24		TLM2	
2.	Use case on neural networks.	1	08/11/24		TLM2	

**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****PEVALUATION PROCESS (R20 Regulation):**

Evaluation Task	Marks
Assignment-I (Units-I, II & UNIT-III (Half of the Syllabus))	A1=5
I-Descriptive Examination (Units-I, II & UNIT-III (Half of the Syllabus))	M1=15
I-Quiz Examination (Units-I, II & UNIT-III (Half of the Syllabus))	Q1=10
Assignment-II (Unit-III (Remaining Half of the Syllabus), IV & V)	A2=5
II- Descriptive Examination (UNIT-III (Remaining Half of the Syllabus), IV & V)	M2=15
II-Quiz Examination (UNIT-III (Remaining Half of the Syllabus), IV & V)	Q2=10

Mid Marks =80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE): M	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

## PART-D

### PROGRAMME OUTCOMES (POs):

PO 1	<b>Engineering knowledge:</b> Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	<b>Problem analysis:</b> Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	<b>Design/development of solutions:</b> Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	<b>Conduct investigations of complex problems:</b> Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	<b>Modern tool usage:</b> Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
PO 6	<b>The engineer and society:</b> Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO 7	<b>Environment and sustainability:</b> Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	<b>Ethics:</b> Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	<b>Individual and team work:</b> Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	<b>Communication:</b> Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	<b>Project management and finance:</b> Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	<b>Life-long learning:</b> Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

**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>	<b>Mr K.Raviteja</b>	<b>Mr K.Raviteja</b>	<b>Mrs M.Hemalatha</b>	<b>Dr.B.Srinivasa Rao</b>
<b>Signature</b>				





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Phone: 08659-222933, Fax: 08659-222931

## DEPARTMENT OF INFORMATION TECHNOLOGY

### COURSE HANDOUT

#### PART-A

**Name of Course Instructor: Dr. Annapareddy V N Reddy**

**Course Name & Code** : NATURAL LANGUAGE PROCESSING, 20AD09

**L-T-P Structure** : 3-0-0

**Credits: 03**

**Program/Sem/Sec** : B.Tech-IT / VII SEM/A

**A.Y.** : 2024-25

**PRE-REQUISITE:** Nil

**COURSE EDUCATIONAL OBJECTIVES (CEOs):** The Objective of the course is to make learn the basic elements of C programming, control structures, derived data types, Modular programming, user defined structures, basics of files and its I/O operations.

<b>CO1</b>	Familiar with the basic components of NLP. ( <b>Understand - L2</b> )
<b>CO2</b>	Applying N-gram models to predict a sequence of text. ( <b>Apply - L3</b> )
<b>CO3</b>	Build a basic language understanding system using preliminary concepts of NLTK library. ( <b>Apply - L3</b> )
<b>CO4</b>	Exposure on advanced techniques for understanding patterns in text ( <b>Apply-L3</b> )
<b>CO5</b>	Understand the semantics of linguistic components in a natural dialogue ( <b>Understand - L2</b> )

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

CO	Program Outcomes (POs)												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	2	2	-	-	3	-	-	-	-	-	-	2	2	-	-
CO2	3	2	-	-	-	-	-	-	-	-	-	-	1	-	-
CO3	3	2	-	-	-	-	-	-	-	-	-	-	1	-	-
CO4	2	-	3	-	3	-	-	-	-	-	-	-	2	-	-
CO5	-	2	3	-	3	-	-	-	-	-	-	-	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. Daniel Jurafsky, James H. Martin ,”Speech and Language Processing” , Third Edition, PHI, 2020.
2. <https://realpython.com/nltk-nlp-python/#getting-text-to-analyze>

**REFERENCE BOOKS:**

1. Natural Language Processing with Python: Analysing Text with the Natural Language Toolkit, Steven Bird, Ewan Klein, 2011
2. Applied Text Analysis with Python: Enabling Language-Aware Data Products with Machine Learning, Benjamin Bengfort, Rebecca Bilbro, 2018
3. Speech and Language Processing, 2nd Edition, Daniel Jurafsky, James H. Martin, 2009

**COURSE DELIVERY PLAN (LESSON PLAN):****UNIT-I: Introduction**

S.No	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcomes	HOD Sign Weekly
1	Introduction to NLP	1	25-06-2024		TLM1	CO1	
2	Knowledge in Speech and Language Processing	2	26-06-2024 28-06-2024		TLM1	CO1	
3	Ambiguity; Models and Algorithms	2	29-06-2024 02-07-2024		TLM1	CO1	
4	Language, Thought and Understanding;	2	03-07-2024 05-07-2024		TLM1	CO1	
5	History Regular Expressions Regular Expression	2	06-07-2024 09-07-2024		TLM1	CO1	
6	Words; Corpora;	2	10-07-2024 12-07-2024		TLM1	CO1	
7	Text Normalization	2	13-07-2024 16-07-2024		TLM1	CO1	
8	Minimum Edit Distance	2	19-07-2024 20-07-2024		TLM1	CO1	
9	Unit-I Assignment Test	1	23-07-2024		TLM1	CO1	
No. of classes required to complete UNIT-I		16	No. of classes taken:				

**UNIT-II: N-gram Language Models**

S.No	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcomes	HOD Sign Weekly	
10	N-Grams; Evaluating Language Models	2	24-07-2024 26-07-2024		TLM1	CO2		
11	Generalization and Zeros.	2	27-07-2024 30-07-2024		TLM1	CO2		
12	Smoothing: Laplace Smoothing	2	31-07-2024 02-08-2024		TLM1	CO2		
13	Add-k Smoothing	2	03-08-2024 06-08-2024		TLM1	CO2		
14	Backoff and Interpolation	2	07-08-2024 09-08-2024		TLM1	CO2		
15	Kneser-Ney Smoothing	2	10-08-2024 13-08-2024		TLM1	CO2		
16	Unit-II Assignment Test	1	14-08-2024		TLM1	CO2		
No. of classes required to complete UNIT-2		13	No. of classes taken:					

**UNIT – III: Natural language processing tools in Python (NLTK Package)**

S.No	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcomes	HOD Sign Weekly
17	Part-I: Introduction to NLTK	2	16-08-2024 17-08-2024		TLM1	CO3	
18	Tokenizing; Filtering Stop words; Stemming	2	20-08-2024 21-08-2024		TLM1	CO3	
19	Tagging parts of speech; Lemmatizing;	2	23-08-2024 24-08-2024		TLM1	CO3	
20	Chunking	2	27-08-2024 28-08-2024		TLM1	CO3	
21	Chinking Part-II: Using Named Entity Recognition (NER)	2	30-08-2024 31-08-2024		TLM1	CO3	
22	Getting Text to Analyze	2	10-09-2024 11-09-2024		TLM1	CO3	
23	Using a Concordance	2	13-09-2024 14-09-2024		TLM1	CO3	
24	Making a Dispersion Plot.	2	17-09-2024 18-09-2024		TLM1	CO3	
25	Unit-III Assignment Test	1	20-09-2024		TLM1	CO3	

No. of classes required to complete UNIT-3	17	No. of classes taken:
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#### UNIT-IV: Information Extraction

S.No	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcomes	HOD Sign Weekly	
26	Relation Extraction Algorithms	2	21-09-2024 24-09-2024		TLM1	CO4		
27	Using Patterns to extract relations	2	25-09-2024 27-09-2024		TLM1	CO4		
28	Relation extraction via supervised learning	2	28-09-2024 01-10-2024		TLM1	CO4		
29	Semi supervised relation extraction via bootstrapping	2	01-10-2024 04-10-2024		TLM1	CO4		
30	Distant Supervision for Relation Extraction	2	05-10-2024 08-10-2024		TLM1	CO4		
31	Evaluation of Relation Extraction	2	15-10-2024		TLM1	CO4		
32	Extracting Times	2	16-10-2024		TLM1	CO4		
33	Extracting Events and their Times; Template Filling	2	18-10-2024 19-10-2024		TLM1	CO4		
34	Unit-IV Assignment Test	1	22-10-2024		TLM1	CO4		
No. of classes required to complete UNIT-4		17	No. of classes taken:					

#### UNIT-V: Word Senses and WordNet

S.No	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcomes	HOD Sign Weekly
35	Defining Word Senses, How many senses do words have	2	23-10-2024 25-10-2024		TLM1	CO5	
36	Relations between senses	2	26-10-2024 29-10-2024		TLM1	CO5	
37	WordNet: Sense relations in WordNet	2	30-10-2024		TLM1	CO5	
38	Word Sense Disambiguation	1	02-11-2024		TLM1	CO5	
39	Alternate WSD algorithms and Tasks	1	05-11-2024		TLM1	CO5	
40	Alternate WSD algorithms and Tasks	1	08-11-2024		TLM1	CO5	
41	Unit-V Assignment Test	1	09-11-2024		TLM1	CO5	
No. of classes required to complete UNIT-5		10	No. of classes taken:				

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

### EVALUATION PROCESS:

<b>Evaluation Task</b>	<b>Marks</b>
Assignment-I (Units-I, II & UNIT-III (Half of the Syllabus))	A1=5
I-Descriptive Examination (Units-I, II & UNIT-III (Half of the Syllabus))	M1=15
I-Quiz Examination (Units-I, II & UNIT-III (Half of the Syllabus))	Q1=10
Assignment-II (Unit-III (Remaining Half of the Syllabus), IV & V)	A2=5
II- Descriptive Examination (UNIT-III (Remaining Half of the Syllabus), IV & V)	M2=15
II-Quiz Examination (UNIT-III (Remaining Half of the Syllabus), IV & V)	Q2=10
Mid Marks =80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	<b>M=30</b>
<b>Cumulative Internal Examination (CIE): M</b>	<b>30</b>
<b>Semester End Examination (SEE)</b>	<b>70</b>
<b>Total Marks = CIE + SEE</b>	<b>100</b>

## PART-D

### PROGRAMME OUTCOMES (POs):

PO 1	<b>Engineering knowledge:</b> Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	<b>Problem analysis:</b> Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	<b>Design/development of solutions:</b> Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	<b>Conduct investigations of complex problems:</b> Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	<b>Modern tool usage:</b> Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
PO 6	<b>The engineer and society:</b> Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO 7	<b>Environment and sustainability:</b> Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development
PO 8	<b>Ethics:</b> Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	<b>Individual and team work:</b> Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	<b>Communication:</b> Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	<b>Project management and finance:</b> Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments
PO 12	<b>Life-long learning:</b> Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

### PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Dr. A.V.N.Reddy	Dr. A.V.N.Reddy	Mrs.M.Hema Latha	Dr. B. Srinivasa Rao
Signature				



# LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)

Accredited by NAAC & NBA (Under Tier - I), ISO 9001:2015 Certified Institution

Approved by AICTE, New Delhi. and Affiliated to JNTUK, Kakinada

L.B. REDDY NAGAR, MYLAVARAM, KRISHNA DIST., A.P.-521 230.

Phone: 08659-222933, Fax: 08659-222931

## DEPARTMENT OF INFORMATION TECHNOLOGY

### COURSE HANDOUT

#### PART-A

**Name of Course Instructor: Dr. Annapareddy V N Reddy**

**Course Name & Code** : NATURAL LANGUAGE PROCESSING, 20AD09

**L-T-P Structure** : 3-0-0

**Credits: 03**

**Program/Sem/Sec** : B.Tech-IT / VII SEM/B

**A.Y.** : 2024-25

**PRE-REQUISITE:** Nil

**COURSE EDUCATIONAL OBJECTIVES (CEOs):** The Objective of the course is to make learn the basic elements of C programming, control structures, derived data types, Modular programming, user defined structures, basics of files and its I/O operations.

<b>CO1</b>	Familiar with the basic components of NLP. ( <b>Understand - L2</b> )
<b>CO2</b>	Applying N-gram models to predict a sequence of text. ( <b>Apply - L3</b> )
<b>CO3</b>	Build a basic language understanding system using preliminary concepts of NLTK library. ( <b>Apply - L3</b> )
<b>CO4</b>	Exposure on advanced techniques for understanding patterns in text ( <b>Apply-L3</b> )
<b>CO5</b>	Understand the semantics of linguistic components in a natural dialogue ( <b>Understand - L2</b> )

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

CO	Program Outcomes (POs)												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	2	2	-	-	3	-	-	-	-	-	-	2	2	-	-
CO2	3	2	-	-	-	-	-	-	-	-	-	-	1	-	-
CO3	3	2	-	-	-	-	-	-	-	-	-	-	1	-	-
CO4	2	-	3	-	3	-	-	-	-	-	-	-	2	-	-
CO5	-	2	3	-	3	-	-	-	-	-	-	-	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. Daniel Jurafsky, James H. Martin ,”Speech and Language Processing” , Third Edition, PHI, 2020.
2. <https://realpython.com/nltk-nlp-python/#getting-text-to-analyze>

**REFERENCE BOOKS:**

1. Natural Language Processing with Python: Analysing Text with the Natural Language Toolkit, Steven Bird, Ewan Klein, 2011
2. Applied Text Analysis with Python: Enabling Language-Aware Data Products with Machine Learning, Benjamin Bengfort, Rebecca Bilbro, 2018
3. Speech and Language Processing, 2nd Edition, Daniel Jurafsky, James H. Martin, 2009

**COURSE DELIVERY PLAN (LESSON PLAN):****UNIT-I: Introduction**

S.No	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcomes	HOD Sign Weekly
1	Introduction to NLP	1	24-06-2024		TLM1	CO1	
2	Knowledge in Speech and Language Processing	2	25-06-2024 27-06-2024		TLM1	CO1	
3	Ambiguity; Models and Algorithms	2	28-06-2024 01-07-2024		TLM1	CO1	
4	Language, Thought and Understanding;	2	02-07-2024 04-07-2024		TLM1	CO1	
5	History Regular Expressions Regular Expression	2	05-07-2024 08-07-2024		TLM1	CO1	
6	Words; Corpora;	2	09-07-2024 11-07-2024		TLM1	CO1	
7	Text Normalization	2	12-07-2024 15-07-2024		TLM1	CO1	
8	Minimum Edit Distance	2	16-07-2024 18-07-2024		TLM1	CO1	
9	Unit-I Assignment Test	1	19-07-2024		TLM1	CO1	
No. of classes required to complete UNIT-I		16	No. of classes taken:				



**UNIT-II: N-gram Language Models**

S.No	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcomes	HOD Sign Weekly	
10	N-Grams; Evaluating Language Models	2	22-07-2024 23-07-2024		TLM1	CO2		
11	Generalization and Zeros.	2	25-07-2024 26-07-2024		TLM1	CO2		
12	Smoothing: Laplace Smoothing	2	29-07-2024 30-08-2024		TLM1	CO2		
13	Add-k Smoothing	2	01-08-2024 02-08-2024		TLM1	CO2		
14	Backoff and Interpolation	2	05-08-2024 06-08-2024		TLM1	CO2		
15	Kneser-Ney Smoothing	2	08-08-2024 09-08-2024		TLM1	CO2		
16	Unit-II Assignment Test	1	12-08-2024		TLM1	CO2		
No. of classes required to complete UNIT-2		13	No. of classes taken:					

**UNIT – III: Natural language processing tools in Python (NLTK Package)**

S.No	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcomes	HOD Sign Weekly
17	Part-I: Introduction to NLTK	2	13-08-2024 15-08-2024		TLM1	CO3	
18	Tokenizing; Filtering Stop words; Stemming	2	16-08-2024 19-08-2024		TLM1	CO3	
19	Tagging parts of speech; Lemmatizing;	2	20-08-2024 22-08-2024		TLM1	CO3	
20	Chunking	2	23-08-2024 26-08-2024		TLM1	CO3	
21	Chinking Part-II: Using Named Entity Recognition (NER)	2	27-08-2024 29-08-2024		TLM1	CO3	
22	Getting Text to Analyze	2	30-09-2024 12-09-2024		TLM1	CO3	
23	Using a Concordance	2	13-09-2024 16-09-2024		TLM1	CO3	
24	Making a Dispersion Plot.	2	17-09-2024 19-09-2024		TLM1	CO3	
25	Unit-III Assignment Test	1	20-09-2024		TLM1	CO3	

No. of classes required to complete UNIT-3	17	No. of classes taken:
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#### UNIT-IV: Information Extraction

S.No	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcomes	HOD Sign Weekly	
26	Relation Extraction Algorithms	2	23-09-2024 24-09-2024		TLM1	CO4		
27	Using Patterns to extract relations	2	26-09-2024 27-09-2024		TLM1	CO4		
28	Relation extraction via supervised learning	2	30-09-2024 01-10-2024		TLM1	CO4		
29	Semi supervised relation extraction via bootstrapping	2	03-10-2024 04-10-2024		TLM1	CO4		
30	Distant Supervision for Relation Extraction	2	07-10-2024 08-10-2024		TLM1	CO4		
31	Evaluation of Relation Extraction	2	14-10-2024		TLM1	CO4		
32	Extracting Times	2	15-10-2024		TLM1	CO4		
33	Extracting Events and their Times; Template Filling	2	17-10-2024 18-10-2024		TLM1	CO4		
34	Unit-IV Assignment Test	1	21-10-2024		TLM1	CO4		
No. of classes required to complete UNIT-4		17	No. of classes taken:					

#### UNIT-V: Word Senses and WordNet

S.No	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcomes	HOD Sign Weekly
35	Defining Word Senses, How many senses do words have	2	22-10-2024 24-10-2024		TLM1	CO5	
36	Relations between senses	2	25-10-2024 28-10-2024		TLM1	CO5	
37	WordNet: Sense relations in WordNet	2	29-10-2024 31-10-2024		TLM1	CO5	
38	Word Sense Disambiguation	1	01-11-2024		TLM1	CO5	
39	Alternate WSD algorithms and Tasks	1	04-11-2024		TLM1	CO5	
40	Alternate WSD algorithms and Tasks	1	05-11-2024 07-11-2024		TLM1	CO5	
41	Unit-V Assignment Test	1	08-11-2024		TLM1	CO5	
No. of classes required to complete UNIT-5		10	No. of classes taken:				

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

### EVALUATION PROCESS:

<b>Evaluation Task</b>	<b>Marks</b>
Assignment-I (Units-I, II & UNIT-III (Half of the Syllabus))	A1=5
I-Descriptive Examination (Units-I, II & UNIT-III (Half of the Syllabus))	M1=15
I-Quiz Examination (Units-I, II & UNIT-III (Half of the Syllabus))	Q1=10
Assignment-II (Unit-III (Remaining Half of the Syllabus), IV & V)	A2=5
II- Descriptive Examination (UNIT-III (Remaining Half of the Syllabus), IV & V)	M2=15
II-Quiz Examination (UNIT-III (Remaining Half of the Syllabus), IV & V)	Q2=10
Mid Marks =80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	<b>M=30</b>
<b>Cumulative Internal Examination (CIE): M</b>	<b>30</b>
<b>Semester End Examination (SEE)</b>	<b>70</b>
<b>Total Marks = CIE + SEE</b>	<b>100</b>

## PART-D

### PROGRAMME OUTCOMES (POs):

PO 1	<b>Engineering knowledge:</b> Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	<b>Problem analysis:</b> Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	<b>Design/development of solutions:</b> Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
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PO 6	<b>The engineer and society:</b> Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO 7	<b>Environment and sustainability:</b> Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development
PO 8	<b>Ethics:</b> Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
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PO 10	<b>Communication:</b> Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	<b>Project management and finance:</b> Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments
PO 12	<b>Life-long learning:</b> Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

### PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Dr. A.V.N.Reddy	Dr. A.V.N.Reddy	Mrs.M.Hema Latha	Dr. B. Srinivasa Rao
Signature				



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(AUTONOMOUS)

Accredited by NAAC & NBA (CSE, IT, ECE, EEE & ME)

Approved by AICTE, New Delhi and Affiliated to JNTUK, Kakinada

L.B.Reddy Nagar, Mylavaram-521230, Krishna Dist, Andhra Pradesh, India

## DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

### COURSE HANDOUT

#### PART-A

Name of Course Instructor : Mr. P. Srihari  
Course Name & Code : Utilization of Electrical Energy & 20EE83  
L-T-P Structure : 3-0-0 Credits : 3  
Program/Sem/Sec : B.Tech, IT, VII-Sem, A-sec A.Y : 2024-25  
Pre-requisites : --NIL

**Course Educational Objective:** This course enables the student to acquire knowledge on methods of Electric Heating and welding, different lighting schemes. It also introduces the concepts of Electric Drives for Industrial and traction system and also different tariff methods.

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

<b>CO 1</b>	Understand mechanism of electric heating and electric welding ( <b>Understanding –L2</b> )
<b>CO 2</b>	Analyze performance of various lighting schemes ( <b>Understanding –L2</b> )
<b>CO 3</b>	Analyze the performance of electric drive systems ( <b>Understanding –L2</b> )
<b>CO 4</b>	Illustrate the different schemes of traction and its main components ( <b>Understanding –L2</b> )
<b>CO5</b>	Understand various tariff methods and power factor improvement techniques. ( <b>Understanding –L2</b> )

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

Cos	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO a	PSO b	PSO c
CO1	2	2	2												
CO2	2	2	2								2				
CO3	2	2	2												
CO4	2	2	2								2				
CO5	2	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).

#### **TEXT BOOKS:**

T1: C.L.Wadhwa “Generation, Distribution and Utilization of Electrical energy, New Age International Publishers, 3<sup>rd</sup> Edition, 2015.

T2: N.V.Suryanarayana “Utilization of electric power including electric drives and electric traction, New age international publishers New Delhi, 2<sup>nd</sup> edition 2014.

#### **REFERENCE BOOKS:**

**R1:** Art & Science of Utilization of electrical Energy, Partab, Dhanpat Rai & Co., 2004.

**R2:** Utilization of Electric Energy, E. Openshaw Taylor and V. V. L. Rao, Universities Press, 2009.

**Part - B**  
**COURSE DELIVERY PLAN (LESSON PLAN):**

**UNIT-I: ELECTRIC HEATING & WELDING**

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	1	24-06-2024		TLM2	
2.	<b>Electric heating:</b> Advantages and methods of Electric heating	1	25-06-2024		TLM1	
3.	Materials for heating elements, Requirement of good heating material	1	26-06-2024		TLM1	
4.	Resistance heating	1	27-06-2024		TLM1	
5.	Resistance heating	1	01-07-2024		TLM2	
6.	Induction heating	1	02-07-2024		TLM1	
7.	Induction heating	1	03-07-2024		TLM2	
8.	Dielectric heating	1	04-07-2024		TLM1	
9.	Causes of failures of heating elements, Arc Furnace - Direct	1	08-07-2024		TLM1	
10.	Arc Furnace-Indirect	1	09-07-2024		TLM2	
11.	<b>Electric Welding:</b> Resistance welding	1	10-07-2024		TLM1	
12.	Resistance welding	1	11-07-2024		TLM2	
13.	Arc welding	1	15-07-2024		TLM1	
14.	Arc welding	1	16-07-2024		TLM2	
15.	Electric welding equipment	1	18-07-2024		TLM1	
16.	Comparison between AC and DC welding	1	22-07-2024		TLM1	
No. of classes required to complete UNIT-I : 16					No. of classes taken:	

**UNIT-II: ILLUMINATION ENGINEERING**

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.	Introduction	1	23-07-2024		TLM2	
18.	Nature of light	1	24-07-2024		TLM1	
19.	Laws of illumination	1	25-07-2024		TLM1	
20.	Laws of illumination	1	29-07-2024		TLM1	
21.	Lighting schemes	1	30-07-2024		TLM1	

22.	Sources of light	1	31-07-2024		TLM1	
23.	Fluorescent Lamp	1	01-08-2024		TLM1	
24.	CFL and LED	1	05-08-2024		TLM2	
25.	Sodium Vapor Lamp	1	06-08-2024		TLM2	
26.	Neon lamps	1	07-08-2024		TLM2	
27.	Mercury vapor lamps	1	08-08-2024		TLM2	
28.	Comparison between tungsten & fluorescent tubes	1	12-08-2024		TLM1	
29.	Requirements of good lighting	1	13-08-2024		TLM1	
30.	Street lighting	1	14-08-2024		TLM	
31.	Revision	1	19-08-2024		TLM1	
No. of classes required to complete UNIT-II : 15					No. of classes taken:	

### UNIT-III: ELECTRIC DRIVES

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
32.	Introduction	1	20-08-2024		TLM2	
33.	Elements of drive, advantages	1	21-08-2024		TLM1	
34.	Factors affecting selection of motor	1	22-08-2024		TLM1	
35.	Types of loads	1	27-08-2024		TLM2	
36.	Steady state characteristics of drives	1	28-08-2024		TLM1	
37.	Steady state characteristics of drives	1	29-08-2024		TLM1	
38.	Transient Characteristics of drives	1	09-09-2024		TLM1	
39.	Transient Characteristics of drives	1	10-09-2024		TLM1	
40.	Size of motor	1	11-09-2024		TLM1	
41.	Load Equalization	1	12-09-2024		TLM1	
42.	Industrial applications	1	17-09-2024		TLM2	
No. of classes required to complete UNIT-III : 11					No. of classes taken:	

### UNIT-IV: ELECTRIC TRACTION

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
43.	Introduction	1	18-09-2024		TLM2	
44.	Requirement of an ideal traction system	1	19-09-2024		TLM1	

45.	Supply system for electric traction	1	23-09-2024		TLM1
46.	Traction motors	1	24-09-2024		TLM1
47.	Mechanism of train movement	1	25-09-2024		TLM1
48.	Train movement	1	26-09-2024		TLM1
49.	Modern trends in electric traction	1	30-09-2024		TLM2
50.	Mechanics for train movement	1	01-10-2024		TLM1
51.	Speed time curves for different services	1	03-10-2024		TLM1
52.	Trapezoidal speed time curves	1	07-10-2024		TLM1
53.	Quadrilateral speed time curves	1	08-10-2024		TLM1
54.	Problems on train movement	1	09-10-2024		TLM1
55.	Problems on train movement	1	10-10-2024		TLM1
56.	Revision	1	14-10-2024		TLM1
No. of classes required to complete UNIT-IV : 14					No. of classes taken:

#### UNIT-V: TARIFF AND POWER FACTOR IMPROVEMENT

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
57.	Tariff: Desirable characteristics	1	15-10-2024		TLM1	
58.	Types of tariff	1	16-10-2024		TLM1	
59.	Flat rate tariff	1	17-10-2024		TLM1	
60.	Block-rate tariff	1	21-10-2024		TLM1	
61.	KVA maximum demand tariff	1	22-10-2024		TLM1	
62.	Time of Day tariff	1	23-10-2024		TLM1	
63.	Disadvantages of low power factor	1	24-10-2024		TLM1	
64.	Advantages of improved power factor	1	28-10-2024		TLM1	
65.	Power factor Improvement devices	1	29-10-2024		TLM2	
66.	Power factor improvement using static capacitor	1	30-10-2024		TLM2	
67.	Most economical power factor	1	04-11-2024		TLM1	
68.	Location of power factor improvement devices from consumer	1	05-11-2024		TLM2	



69.	Assignment/Quiz	1	06-11-2024		TLM3
70.	Revision	1	07-11-2024		TLM1
No. of classes required to complete UNIT-V : 14					No. of classes taken:

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
Assignment-I (Units-I, II & UNIT-III (Half of the Syllabus))	A1=5
I-Descriptive Examination (Units-I, II & UNIT-III (Half of the Syllabus))	M1=15
I-Quiz Examination (Units-I, II & UNIT-III (Half of the Syllabus))	Q1=10
Assignment-II (Unit-III (Remaining Half of the Syllabus), IV & V)	A2=5
II- Descriptive Examination (UNIT-III (Remaining Half of the Syllabus), IV & V)	M2=15
II-Quiz Examination (UNIT-III (Remaining Half of the Syllabus), IV & V)	Q2=10
Mid Marks =80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE): M	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

## PART-D

### PROGRAMME OUTCOMES (POs):

<b>PO 1</b>	<b>Engineering knowledge:</b> Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
<b>PO 2</b>	<b>Problem analysis:</b> Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
<b>PO 3</b>	<b>Design/development of solutions:</b> Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
<b>PO 4</b>	<b>Conduct investigations of complex problems:</b> Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
<b>PO 5</b>	<b>Modern tool usage:</b> Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations
<b>PO 6</b>	<b>The engineer and society:</b> Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
<b>PO 7</b>	<b>Environment and sustainability:</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>PO 8</b>	<b>Ethics:</b> Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
<b>PO 9</b>	<b>Individual and team work:</b> Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
<b>PO 10</b>	<b>Communication:</b> Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
<b>PO 11</b>	<b>Project management and finance:</b> Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
<b>PO 12</b>	<b>Life-long learning:</b> Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

### PROGRAMME SPECIFIC OUTCOMES (PSOs):

#### Program Specific Outcomes (PSOs):

**PSO1:** To apply the fundamental engineering knowledge, computational principles, and methods for extracting knowledge from data to identify, formulate and solve real time problems.

**PSO2:** To develop multidisciplinary projects with advanced technologies and tools to address social and environmental issues.

**PSO3:** To provide a concrete foundation and enrich their abilities for Employment and Higher studies in Artificial Intelligence and Data science with ethical values.

Mr. P. Srihari	Dr.A.V.G.A.Marthanda	Dr.M.S.Giridhar	Dr.J.Siva vara prasad
Course Instructor	Course Coordinator	Module Coordinator	HOD



# LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)

Accredited by NAAC & NBA (CSE, IT, ECE, EEE & ME)

Approved by AICTE, New Delhi and Affiliated to JNTUK, Kakinada

L.B.Reddy Nagar, Mylavaram-521230, Krishna Dist, Andhra Pradesh, India

## DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

### COURSE HANDOUT

#### PART-A

Name of Course Instructor : Mr. Y. Raghuvamsi  
Course Name & Code : Utilization of Electrical Energy & 20EE83  
L-T-P Structure : 3-0-0 Credits : 3  
Program/Sem/Sec : B.Tech, IT, VII-Sem, B-sec A.Y : 2024-25  
Pre-requisites : --NIL

**Course Educational Objective:** This course enables the student to acquire knowledge on methods of Electric Heating and welding, different lighting schemes. It also introduces the concepts of Electric Drives for Industrial and traction system and also different tariff methods.

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

CO 1	Understand mechanism of electric heating and electric welding ( <b>Understanding –L2</b> )
CO 2	Analyze performance of various lighting schemes ( <b>Understanding –L2</b> )
CO 3	Analyze the performance of electric drive systems ( <b>Understanding –L2</b> )
CO 4	Illustrate the different schemes of traction and its main components ( <b>Understanding –L2</b> )
CO5	Understand various tariff methods and power factor improvement techniques. ( <b>Understanding –L2</b> )

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

Cos	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO a	PSO b	PSO c
CO1	2	2	2												
CO2	2	2	2								2				
CO3	2	2	2												
CO4	2	2	2								2				
CO5	2	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).

#### **TEXT BOOKS:**

T1: C.L.Wadhwa “Generation, Distribution and Utilization of Electrical energy, New Age International Publishers, 3<sup>rd</sup> Edition, 2015.

T2: N.V.Suryanarayana “Utilization of electric power including electric drives and electric traction, New age international publishers New Delhi, 2<sup>nd</sup> edition 2014.

#### **REFERENCE BOOKS:**

**R1:** Art & Science of Utilization of electrical Energy, Partab, Dhanpat Rai & Co., 2004.

**R2:** Utilization of Electric Energy, E. Openshaw Taylor and V. V. L. Rao, Universities Press, 2009.

**Part - B**  
**COURSE DELIVERY PLAN (LESSON PLAN):**

**UNIT-I: ELECTRIC HEATING & WELDING**

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	1	26/06/2024		TLM2	
2.	<b>Electric heating:</b> Advantages and methods of Electric heating	1	27/06/2024		TLM1	
3.	Materials for heating elements, Requirement of good heating material	1	28/06/2024		TLM1	
4.	Resistance heating	1	29/06/2024		TLM1	
5.	Resistance heating	1	03/07/2024		TLM2	
6.	Induction heating	1	04/07/2024		TLM1	
7.	Induction heating	1	05/07/2024		TLM2	
8.	Dielectric heating	1	06/07/2024		TLM1	
9.	Causes of failures of heating elements, Arc Furnace - Direct	1	10/07/2024		TLM1	
10.	Arc Furnace-Indirect	1	11/07/2024		TLM2	
11.	<b>Electric Welding:</b> Resistance welding	1	12/07/2024		TLM1	
12.	Resistance welding	1	13/07/2024		TLM2	
13.	Arc welding	1	18/07/2024		TLM1	
14.	Arc welding	1	19/07/2024		TLM2	
15.	Electric welding equipment	1	20/07/2024		TLM1	
16.	Comparison between AC and DC welding	1	24/07/2024		TLM1	
No. of classes required to complete UNIT-I : 16					No. of classes taken:	

**UNIT-II: ILLUMINATION ENGINEERING**

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.	Introduction	1	25/07/2024		TLM2	
18.	Nature of light	1	26/07/2024		TLM1	
19.	Laws of illumination	1	27/07/2024		TLM1	
20.	Laws of illumination	1	31/07/2024		TLM1	
21.	Lighting schemes	1	01/08/2024		TLM1	

22.	Sources of light	1	02/08/2024		TLM1	
23.	Fluorescent Lamp	1	03/08/2024		TLM1	
24.	CFL and LED	1	07/08/2024		TLM2	
25.	Sodium Vapor Lamp	1	08/08/2024		TLM2	
26.	Neon lamps	1	09/08/2024		TLM2	
27.	Mercury vapor lamps	1	10/08/2024		TLM2	
28.	Comparison between tungsten & fluorescent tubes	1	14/08/2024		TLM1	
29.	Requirements of good lighting	1	16/08/2024		TLM1	
30.	Street lighting	1	17/08/2024		TLM	
31.	Revision	1	21/08/2024		TLM1	
No. of classes required to complete UNIT-II : 15					No. of classes taken:	

### UNIT-III: ELECTRIC DRIVES

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
32.	Introduction	1	22/08/2024		TLM2	
33.	Elements of drive, advantages	1	23/08/2024		TLM1	
34.	Factors affecting selection of motor	1	24/08/2024		TLM1	
35.	Types of loads	1	28/08/2024		TLM2	
36.	Steady state characteristics of drives	1	29/08/2024		TLM1	
37.	Steady state characteristics of drives	1	30/08/2024		TLM1	
38.	Transient Characteristics of drives	1	31/08/2024		TLM1	
39.	Transient Characteristics of drives	1	11/09/2024		TLM1	
40.	Size of motor	1	12/09/2024		TLM1	
41.	Load Equalization	1	13/09/2024		TLM1	
42.	Industrial applications	1	14/09/2024		TLM2	
No. of classes required to complete UNIT-III : 11					No. of classes taken:	

### UNIT-IV: ELECTRIC TRACTION

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
43.	Introduction	1	18/09/2024		TLM2	
44.	Requirement of an ideal traction system	1	19/09/2024		TLM1	

45.	Supply system for electric traction	1	20/09/2024		TLM1
46.	Traction motors	1	21/09/2024		TLM1
47.	Mechanism of train movement	1	25/09/2024		TLM1
48.	Train movement	1	26/09/2024		TLM1
49.	Modern trends in electric traction	1	27/09/2024		TLM2
50.	Mechanics for train movement	1	28/09/2024		TLM1
51.	Speed time curves for different services	1	03/10/2024		TLM1
52.	Trapezoidal speed time curves	1	04/10/2024		TLM1
53.	Quadrilateral speed time curves	1	05/10/2024		TLM1
54.	Problems on train movement	1	09/10/2024		TLM1
55.	Problems on train movement	1	10/10/2024		TLM1
56.	Revision	1	16/10/2024		TLM1
No. of classes required to complete UNIT-IV : 14					No. of classes taken:

#### UNIT-V: TARIFF AND POWER FACTOR IMPROVEMENT

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
57.	Tariff: Desirable characteristics	1	17/10/2024		TLM1	
58.	Types of tariff	1	18/10/2024		TLM1	
59.	Flat rate tariff	1	19/10/2024		TLM1	
60.	Block-rate tariff	1	23/10/2024		TLM1	
61.	KVA maximum demand tariff	1	24/10/2024		TLM1	
62.	Time of Day tariff	1	25/10/2024		TLM1	
63.	Disadvantages of low power factor	1	26/10/2024		TLM1	
64.	Advantages of improved power factor	1	30/10/2024		TLM1	
65.	Power factor Improvement devices	1	01/11/2024		TLM2	
66.	Power factor improvement using static capacitor	1	02/11/2024		TLM2	
67.	Most economical power factor	1	06/11/2024		TLM1	
68.	Location of power factor improvement devices from consumer	1	07/11/2024		TLM2	

69.	Assignment/Quiz	1	08/11/2024		TLM3	
70.	Revision	1	09/11/2024		TLM1	
No. of classes required to complete UNIT-V : 14					No. of classes taken:	

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
Assignment-I (Units-I, II & UNIT-III (Half of the Syllabus))	A1=5
I-Descriptive Examination (Units-I, II & UNIT-III (Half of the Syllabus))	M1=15
I-Quiz Examination (Units-I, II & UNIT-III (Half of the Syllabus))	Q1=10
Assignment-II (Unit-III (Remaining Half of the Syllabus), IV & V)	A2=5
II- Descriptive Examination (UNIT-III (Remaining Half of the Syllabus), IV & V)	M2=15
II-Quiz Examination (UNIT-III (Remaining Half of the Syllabus), IV & V)	Q2=10
Mid Marks =80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE): M	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

## PART-D

### PROGRAMME OUTCOMES (POs):

<b>PO 1</b>	<b>Engineering knowledge:</b> Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
<b>PO 2</b>	<b>Problem analysis:</b> Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
<b>PO 3</b>	<b>Design/development of solutions:</b> Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
<b>PO 4</b>	<b>Conduct investigations of complex problems:</b> Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
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<b>PO 11</b>	<b>Project management and finance:</b> Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
<b>PO 12</b>	<b>Life-long learning:</b> Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

### PROGRAMME SPECIFIC OUTCOMES (PSOs):

#### Program Specific Outcomes (PSOs):

**PSO1:** To apply the fundamental engineering knowledge, computational principles, and methods for extracting knowledge from data to identify, formulate and solve real time problems.

**PSO2:** To develop multidisciplinary projects with advanced technologies and tools to address social and environmental issues.

**PSO3:** To provide a concrete foundation and enrich their abilities for Employment and Higher studies in Artificial Intelligence and Data science with ethical values.

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**DEPARTMENT OF CIVIL ENGINEERING**

<http://www.lbrce.ac.in>, [hodcivil@lbrce.ac.in](mailto:hodcivil@lbrce.ac.in) Ph: 08659-222933, Fax: 08659-222931

## COURSE HANDOUT PART-A

Name of Course Instructor : P MOHANAGANGA RAJU  
Course Name & Code : ENVIRONMENTAL SANITATION & 20CE84  
L-T-P Structure : 3-0-0 Credits : 3  
Program/Sem/Sec : B.Tech., VII-Sem., IT/B A.Y : 2024-25

**PRE-REQUISITE:** NIL

**COURSE EDUCATIONAL OBJECTIVES (CEOs):** This course teaches the basic terminology of Environmental sanitation, different methods for control of Communicable and non-communicable diseases, the control techniques for rodent and vectors, sanitation measures that are required in few Institutions, sanitation management aspects due to rural and refuse wastes.

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

<b>CO 1</b>	Recognize the basic terminology of Environmental sanitation.
<b>CO 2</b>	Interpret the control approaches of Communicable and non-communicable diseases.
<b>CO 3</b>	Identify and assess the control approaches for rodent and vectors.
<b>CO 4</b>	Classify the appropriate sanitation measures for several institutions.
<b>CO 5</b>	Categorize the sanitation aspects for rural and refuse management.

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

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	-	-	-	-	1	1	-	-	-	-	1	1	-	1
CO2	2	-	-	-	-	1	1	-	-	-	-	1	1	-	1
CO3	2	-	-	-	-	1	1	-	-	-	-	1	1	-	1
CO4	2	-	-	-	-	1	1	-	-	-	-	1	1	-	1
CO 5	3	-	-	-	-	1	1	-	-	-	-	1	1	-	1

**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** Joseph. A. Salvato, Nelson N. Nemerow, Frankiln J. Agardy, “Environmental Engineering”, John Wiley & Sons, 5th Edition, 2003.

**T2** I.M. Prahlad Edited, “Environmental Sanitation - Reflections from Practice, A Module for Community Health Practitioners”, Society For Community Health Awareness Research and Action, 2015.

**REFERENCE BOOKS:**

**R1** S.K. Garg, “Sewage Disposal and Air pollution engineering”, Khanna Publishers, New Delhi, 2009.

**R2** K.V.S.G. Muralikrishna, “Environmental Sanitation”, Reem Publications, Kakinada, 2003.



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**PART-B**

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

**UNIT –I: ENVIRONMENTAL SANITATION BASICS**

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 of sanitation practices	1	24.06.2024		TLM5	
2.	History sanitation practices	1	27.06.2024		TLM5	
3.	Evolution of sanitation practices	1	28.06.2024		TLM5	
4.	Role of Sanitary Engineer	1	29.06.2024		TLM5	
5.	Sanitation management aspects for liquid wastes	1	01.07.2024		TLM5	
6.	Sanitation management aspects for solid wastes	1	04.07.2024		TLM5	
7.	<b>Revision</b>	1	05.07.2024		TLM5	
8.	Basic Definitions	1	06.07.2024		TLM5	
9.	Basic Definitions	1	08.07.2024		TLM5	
10.	Types of diseases- Communicable diseases	1	11.07.2024		TLM5	
11.	Non-communicable diseases	1	12.07.2024		TLM5	
12.	Water borne diseases	1	15.07.2024		TLM5	
13.	Mortality rates	1	18.07.2024		TLM5	
14.	<b>Revision</b>	1	19.07.2024		TLM5	
15.	<b>Revision</b>	1	20.07.2024		TLM5	
No. of classes required to complete UNIT-I:12				No. of classes taken:		

**UNIT-II: CONTROL OF COMMUNICABLE AND NON-COMMUNICABLE DISEASES**

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.	<b>Communicable Diseases: Impacts,</b>	1	22.07.2024		TLM5	
2.	Control of Source (Agent Factors)	1	25.07.2024		TLM5	
3.	Control of Mode of Transmission Factor (Environmental Factors)	1	26.07.2024		TLM5	
4.	Control of Mode of Transmission Factor (Environmental Factors)	1	27.07.2024		TLM5	
5.	Control of Susceptibles (Host Factors)	1	29.07.2024		TLM5	
6.	Epidemic Control	1	01.08.2024		TLM5	
7.	Revision	1	02.08.2024		TLM5	
8.	Respiratory Diseases- Types, Impacts, Characteristics	1	03.08.2024		TLM5	
9.	Respiratory Diseases- Control	1	05.08.2024		TLM5	
10.	Water borne Diseases- Types, Impacts, Characteristics	1	08.08.2024		TLM5	
11.	Water borne Diseases- Control	1	09.08.2024		TLM5	



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12.	Food borne Diseases- Types, Impacts, Characteristics	1	12.08.2024		TLM5	
13.	Food borne Diseases- Control	1	16.08.2024		TLM5	
14.	Revision	1	17.08.2024		TLM5	
15.	Revision	1	19.08.2024		TLM5	
No. of classes required to complete UNIT-II:12				No. of classes taken:		

**UNIT-III: INSECT VECTOR AND RODENT CONTROL**

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.	Mosquitoes as carriers of diseases	1	22.08.2024		TLM5	
2.	Mosquito control	1	23.08.2024		TLM5	
3.	Larvae control	1	24.08.2024		TLM5	
4.	Adult control	1	29.08.2024		TLM5	
5.	Man-made mosquito breeding centres	1	30.08.2024		TLM5	
6.	Outdoor control of mosquitoes	1	31.08.2024		TLM5	
7.	Revision	1	09.09.2024		TLM5	
8.	Housefly as disease carrier	1	12.09.2024		TLM5	
9.	Fly control	1	13.09.2024		TLM5	
10.	Rodent control	1	19.09.2024		TLM5	
11.	Control Diseases transmitted from Animals.	1	20.09.2024		TLM5	
12.	Revision	1	21.09.2024		TLM5	
13.	Revision	1	23.09.2024		TLM5	
No. of classes required to complete UNIT-III:10				No. of classes taken:		

**UNIT- IV: INSTITUTIONAL SANITATION**

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.	Sanitation measures in hotels	1	26.09.2024		TLM5	
2.	Sanitation measures in Restaurants	1	27.09.2024		TLM5	
3.	Sanitation measures in public bathing ghats	1	28.09.2024		TLM5	
4.	Sanitation measures in Schools	1	30.09.2024		TLM5	
5.	Sanitation measures in Schools	1	03.10.2024		TLM5	
6.	Sanitation measures in Hospitals	1	04.10.2024		TLM5	
7.	Sanitation measures in Hospitals	1	05.10.2024		TLM5	
8.	Sanitation measures in Swimming pools	1	06.10.2024		TLM5	
9.	Sanitation measures in Swimming pools	1	10.10.2024		TLM5	
10.	Sanitation measures in Prisons.	1	14.10.2024		TLM5	
11.	Revision	1	17.10.2024		TLM5	
12.	Revision	1	18.10.2024		TLM5	
No. of classes required to complete UNIT-IV:10				No. of classes taken:		



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**UNIT-V : RURAL AND REFUSE SANITATION**

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.	<b>Rural sanitation:</b> Aqua privy, Septic tank, Soak pit and sulabh mode of sanitation	1	19.10.2024		TLM5	
2.	<b>Rural sanitation:</b> Appropriate low-cost rural sanitation techniques	1	21.10.2024		TLM5	
3.	<b>Rural sanitation:</b> Biogas generation from toilet	1	24.10.2024		TLM5	
4.	<b>Refuse Sanitation:</b> Municipal garbage – sources, generation and collection	1	25.10.2024		TLM5	
5.	<b>Refuse Sanitation:</b> Municipal garbage – recovery and disposal options	1	26.10.2024		TLM5	
6.	<b>Refuse Sanitation:</b> Sanitation problems with regard to: Dumping and sanitary landfilling	1	28.10.2024		TLM5	
7.	<b>Refuse Sanitation:</b> Sanitation problems with regard to: Mass firing of waste and incineration	1	01.11.2024		TLM5	
8.	<b>Refuse Sanitation:</b> Mosquito breeding, Leachate, Management issues	1	02.11.2024		TLM5	
9.	<b>Ecological Sanitation:</b> Principle, Eco-sanitation as a sustainable approach	1	04.11.2024		TLM5	
10.	<b>Occupational health hazards:</b> Concept, Types, Safety aspects of sanitation workers	1	07.11.2024		TLM5	
11.	<b>Revision</b>	1	08.11.2024		TLM5	
No. of classes required to complete UNIT-V:10				No. of classes taken:		

Teaching Learning Methods					
TLM1	Chalk and Talk	TLM4	Problem Solving	TLM7	Seminars or GD
TLM2	PPT	TLM5	Programming	TLM8	Lab Demo
TLM3	Tutorial	TLM6	Assignment or Quiz	TLM9	Case Study

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**EVALUATION PROCESS**

<b>Evaluation Task</b>	<b>Marks</b>
Assignment – 1	A1=5
Assignment – 2	A2=5
I-Mid Examination	M1=15
I-Quiz Examination	Q1=10
Assignment – 3	A3=5
Assignment – 4	A4=5
Assignment – 5	A5=5
II-Mid Examination	M2=15
II-Quiz Examination	Q2=10
Assignment Marks	A=5
Mid Marks	M=15
Quiz Marks	Q=10
<b>Cumulative Internal Examination: A+ +M+Q</b>	<b>30</b>
<b>Semester End Examinations</b>	<b>70</b>
<b>Total Marks</b>	<b>100</b>



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#### PROGRAM OUTCOMES:

- Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and engineering specialization to the solution of complex engineering problems.
- Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural, sciences and engineering sciences.
- Design/development of solutions:** Design solutions for complex engineering problems and design system components, processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
- Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
- The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal, and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
- Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
- Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
- Individual and team work:** Function effectively as an individual, and as a member or leader in teams, and in multidisciplinary settings.
- Communication:** Communicate effectively with the engineering community and with society at large such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
- Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team to manage projects and in multidisciplinary environments.
- Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

#### PROGRAM SPECIFIC OUTCOMES (PSOs)

- PSO1: Possesses necessary skill set to analyze and design various systems using analytical and software tools related to civil engineering
- PSO2: Possesses ability to plan, examine and analyze the various laboratory test required for the professional demands
- PSO3: Possesses basic technical skills to pursue higher studies and professional practice in civil engineering domain

Course Instructor	Course Coordinator	Module Coordinator	HOD
(P MOHANAGANGA RAJU)	(P MOHANAGANGA RAJU)	(J RANGAIAH)	(Dr.J.V.R)

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## COURSE HANDOUT PART-A

Name of Course Instructor : B NARASIMHARAO  
Course Name & Code : ENVIRONMENTAL SANITATION & 20CE84  
L-T-P Structure : 3-0-0 Credits : 3  
Program/Sem/Sec : B.Tech., VII-Sem., IT/A A.Y : 2024-25

**PRE-REQUISITE:** NIL

**COURSE EDUCATIONAL OBJECTIVES (CEOs):** This course teaches the basic terminology of Environmental sanitation, different methods for control of Communicable and non-communicable diseases, the control techniques for rodent and vectors, sanitation measures that are required in few Institutions, sanitation management aspects due to rural and refuse wastes.

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

<b>CO 1</b>	Recognize the basic terminology of Environmental sanitation.
<b>CO 2</b>	Interpret the control approaches of Communicable and non-communicable diseases.
<b>CO 3</b>	Identify and assess the control approaches for rodent and vectors.
<b>CO 4</b>	Classify the appropriate sanitation measures for several institutions.
<b>CO 5</b>	Categorize the sanitation aspects for rural and refuse management.

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

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	-	-	-	-	1	1	-	-	-	-	1	1	-	1
CO2	2	-	-	-	-	1	1	-	-	-	-	1	1	-	1
CO3	2	-	-	-	-	1	1	-	-	-	-	1	1	-	1
CO4	2	-	-	-	-	1	1	-	-	-	-	1	1	-	1
CO 5	3	-	-	-	-	1	1	-	-	-	-	1	1	-	1

**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** Joseph. A. Salvato, Nelson N. Nemerow, Frankiln J. Agardy, “Environmental Engineering”, John Wiley & Sons, 5th Edition, 2003.

**T2** I.M. Prahlad Edited, “Environmental Sanitation - Reflections from Practice, A Module for Community Health Practitioners”, Society For Community Health Awareness Research and Action, 2015.

**REFERENCE BOOKS:**

**R1** S.K. Garg, “Sewage Disposal and Air pollution engineering”, Khanna Publishers, New Delhi, 2009.

**R2** K.V.S.G. Muralikrishna, “Environmental Sanitation”, Reem Publications, Kakinada, 2003.



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**PART-B**

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

**UNIT –I: ENVIRONMENTAL SANITATION BASICS**

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 of sanitation practices	1	25.06.2024		TLM5	
2.	History sanitation practices	1	26.06.2024		TLM5	
3.	Evolution of sanitation practices	1	28.06.2024		TLM5	
4.	Role of Sanitary Engineer	1	29.06.2024		TLM5	
5.	Sanitation management aspects for liquid wastes	1	02.07.2024		TLM5	
6.	Sanitation management aspects for solid wastes	1	03.07.2024		TLM5	
7.	<b>Revision</b>	1	05.07.2024		TLM5	
8.	Basic Definitions	1	06.07.2024		TLM5	
9.	Basic Definitions	1	09.07.2024		TLM5	
10.	Types of diseases- Communicable diseases	1	10.07.2024		TLM5	
11.	Non-communicable diseases	1	12.07.2024		TLM5	
12.	Water borne diseases	1	16.07.2024		TLM5	
13.	Mortality rates	1	19.07.2024		TLM5	
14.	<b>Revision</b>	1	20.07.2024		TLM5	
15.	<b>Revision</b>	1	23.07.2024		TLM5	
No. of classes required to complete UNIT-I:12				No. of classes taken:		

**UNIT-II: CONTROL OF COMMUNICABLE AND NON-COMMUNICABLE DISEASES**

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.	<b>Communicable Diseases: Impacts,</b>	1	24.07.2024		TLM5	
2.	Control of Source (Agent Factors)	1	26.07.2024		TLM5	
3.	Control of Mode of Transmission Factor (Environmental Factors)	1	27.07.2024		TLM5	
4.	Control of Mode of Transmission Factor (Environmental Factors)	1	30.07.2024		TLM5	
5.	Control of Susceptibles (Host Factors)	1	31.07.2024		TLM5	
6.	Epidemic Control	1	02.08.2024		TLM5	
7.	Revision	1	03.08.2024		TLM5	
8.	Respiratory Diseases- Types, Impacts, Characteristics	1	06.08.2024		TLM5	
9.	Respiratory Diseases- Control	1	07.08.2024		TLM5	
10.	Water borne Diseases- Types, Impacts, Characteristics	1	09.08.2024		TLM5	
11.	Water borne Diseases- Control	1	13.08.2024		TLM5	





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12.	Food borne Diseases- Types, Impacts, Characteristics	1	14.08.2024		<b>TLM5</b>	
13.	Food borne Diseases- Control	1	16.08.2024		<b>TLM5</b>	
14.	Revision	1	17.08.2024		<b>TLM5</b>	
15.	<b>Revison</b>	1	20.08.2024		<b>TLM5</b>	
No. of classes required to complete UNIT-II:12				No. of classes taken:		

**UNIT-III: INSECT VECTOR AND RODENT CONTROL**

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.	Mosquitoes as carriers of diseases	1	21.08.2024		<b>TLM5</b>	
2.	Mosquito control	1	23.08.2024		<b>TLM5</b>	
3.	Larvae control	1	24.08.2024		<b>TLM5</b>	
4.	Adult control	1	27.08.2024		<b>TLM5</b>	
5.	Man-made mosquito breeding centres	1	28.08.2024		<b>TLM5</b>	
6.	Outdoor control of mosquitoes	1	30.08.2024		<b>TLM5</b>	
7.	<b>Revison</b>	1	31.08.2024		<b>TLM5</b>	
8.	Housefly as disease carrier	1	10.09.2024		<b>TLM5</b>	
9.	Fly control	1	11.09.2024		<b>TLM5</b>	
10.	Rodent control	1	13.09.2024		<b>TLM5</b>	
11.	Control Diseases transmitted from Animals.	1	14.09.2024		<b>TLM5</b>	
12.	Revision	1	17.09.2024		<b>TLM5</b>	
13.	<b>Revison</b>	1	18.09.2024		<b>TLM5</b>	
No. of classes required to complete UNIT-III:10				No. of classes taken:		

**UNIT- IV: INSTITUTIONAL SANITATION**

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.	Sanitation measures in hotels	1	20.09.2024		<b>TLM5</b>	
2.	Sanitation measures in Restaurants	1	21.09.2024		<b>TLM5</b>	
3.	Sanitation measures in public bathing ghats	1	24.09.2024		<b>TLM5</b>	
4.	Sanitation measures in Schools	1	25.09.2024		<b>TLM5</b>	
5.	Sanitation measures in Schools	1	27.09.2024		<b>TLM5</b>	
6.	Sanitation measures in Hospitals	1	28.09.2024		<b>TLM5</b>	
7.	Sanitation measures in Hospitals	1	01.10.2024		<b>TLM5</b>	
8.	Sanitation measures in Swimming pools	1	04.10.2024		<b>TLM5</b>	
9.	Sanitation measures in Swimming pools	1	05.10.2024		<b>TLM5</b>	
10.	Sanitation measures in Prisons.	1	08.10.2024		<b>TLM5</b>	
11.	Revision	1	09.10.2024		<b>TLM5</b>	
12.	Revision	1	15.10.2024		<b>TLM5</b>	
No. of classes required to complete UNIT-IV:10				No. of classes taken:		



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**UNIT-V : RURAL AND REFUSE SANITATION**

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.	<b>Rural sanitation:</b> Aqua privy, Septic tank, Soak pit and sulabh mode of sanitation	1	16.10.2024		TLM5	
2.	<b>Rural sanitation:</b> Appropriate low-cost rural sanitation techniques	1	18.10.2024		TLM5	
3.	<b>Rural sanitation:</b> Biogas generation from toilet	1	19.10.2024		TLM5	
4.	<b>Refuse Sanitation:</b> Municipal garbage – sources, generation and collection	1	22.10.2024		TLM5	
5.	<b>Refuse Sanitation:</b> Municipal garbage – recovery and disposal options	1	23.10.2024		TLM5	
6.	<b>Refuse Sanitation:</b> Sanitation problems with regard to: Dumping and sanitary landfilling	1	25.10.2024		TLM5	
7.	<b>Refuse Sanitation:</b> Sanitation problems with regard to: Mass firing of waste and incineration	1	26.10.2024		TLM5	
8.	<b>Refuse Sanitation:</b> Mosquito breeding, Leachate, Management issues	1	29.10.2024		TLM5	
9.	<b>Ecological Sanitation:</b> Principle, Eco-sanitation as a sustainable approach	1	30.10.2024		TLM5	
10.	<b>Occupational health hazards:</b> Concept, Types, Safety aspects of sanitation workers	1	01.11.2024		TLM5	
11.	<b>Revision</b>	1	02.11.2024		TLM5	
12.	Revision	1	05.11.2024		TLM5	
13.	Revision	1	06.11.2024		TLM5	
14.	Revision	1	08.11.2024		TLM5	
No. of classes required to complete UNIT-V:10				No. of classes taken:		



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Teaching Learning Methods					
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<b>TLM2</b>	PPT	<b>TLM5</b>	Programming	<b>TLM8</b>	Lab Demo
<b>TLM3</b>	Tutorial	<b>TLM6</b>	Assignment or Quiz	<b>TLM9</b>	Case Study

**EVALUATION PROCESS**

Evaluation Task	Marks
Assignment – 1	A1=5
Assignment – 2	A2=5
I-Mid Examination	M1=15
I-Quiz Examination	Q1=10
Assignment – 3	A3=5
Assignment – 4	A4=5
Assignment – 5	A5=5
II-Mid Examination	M2=15
II-Quiz Examination	Q2=10
Assignment Marks	A=5
Mid Marks	M=15
Quiz Marks	Q=10
<b>Cumulative Internal Examination: A+ +M+Q</b>	<b>30</b>
<b>Semester End Examinations</b>	<b>70</b>
<b>Total Marks</b>	<b>100</b>



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#### PROGRAM OUTCOMES:

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- Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
- Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
- The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal, and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
- Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
- Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
- Individual and team work:** Function effectively as an individual, and as a member or leader in teams, and in multidisciplinary settings.
- Communication:** Communicate effectively with the engineering community and with society at large such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
- Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team to manage projects and in multidisciplinary environments.
- Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

#### PROGRAM SPECIFIC OUTCOMES (PSOs)

- PSO1: Possesses necessary skill set to analyze and design various systems using analytical and software tools related to civil engineering
- PSO2: Possesses ability to plan, examine and analyze the various laboratory test required for the professional demands
- PSO3: Possesses basic technical skills to pursue higher studies and professional practice in civil engineering domain

Course Instructor	Course Coordinator	Module Coordinator	HOD
(B NARASIMHARAO)	(B NARASIMHARAO)	(J RANGAIAH)	(Dr.J.V.R)



# LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)

Accredited by NAAC & NBA (Under Tier - I), ISO 9001:2015 Certified Institution

Approved by AICTE, New Delhi. and Affiliated to JNTUK, Kakinada

L.B. REDDY NAGAR, MYLAVARAM, KRISHNA DIST., A.P.-521 230.

Phone: 08659-222933, Fax: 08659-222931

## DEPARTMENT OF INFORMATION AND TECHNOLOGY

### COURSE HANDOUT PART-A

**Name of Course Instructor:** Ms. P. Mounika, Assistant Professor,

Mechanical Engineering.

**Course Name & Code** : MANAGEMENT SCIENCE FOR  
ENGINEERS & 20HS02

**Regulation:** R20

**L-T-P Structure** : 3-0-0

**Credits:** 03

**Program/Sem/Sec** : B.Tech VII Sem (IT - A)

**A.Y.:** 2024-2025

**PREREQUISITE:** Professional ethics and human values

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

1. To make students understand management, its principles, contribution to management, organization, and its basic issues and types.
2. To make students understand the concept of plant location and its factors and plant layout and types, method of production and work study importance.
3. To understand the purpose and function of statistical quality control. And understand the material management techniques.

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

<b>CO1</b>	Understand management principles to practical situations based on the organization structures. (L2)
<b>CO2</b>	Design Effective plant Layouts by using work study methods. (L2)
<b>CO3</b>	Apply quality control techniques for improvement of quality and materials management. (L3)
<b>CO4</b>	Develop best practices of HRM in corporate Business to raise employee productivity. (L2)
<b>CO5</b>	Identify critical path and project completion time by using CPM and PERT techniques. (L3)

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

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
<b>CO1</b>	3	-	-	-	-	-	-	2	2	-	-	3	-	-	-
<b>CO2</b>	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-
<b>CO3</b>	-	3	-	-	-	-	-	-	-	-	-	3	-	-	-
<b>CO4</b>	-	-	-	-	-	-	-	3	2	-	-	3	-	-	-
<b>CO5</b>	-	-	-	-	-	-	-	-	-	-	2	3	-	-	-
	1 - Low				2 - Medium				3 - High						

<b>PSO 1</b>	To apply the principles of thermal sciences to design and develop various thermal systems.
<b>PSO 2</b>	To apply the principles of manufacturing technology, scientific management towards improvement of quality and optimization of engineering systems in the design, analysis and manufacturability of products.
<b>PSO 3</b>	To apply the basic principles of mechanical engineering design for evaluation of performance of various systems relating to transmission of motion and power, conservation of energy and other process equipment.

**TEXTBOOKS:**

**T1** Dr. A.R.Aryasri, Management Science, TMH, 10th edition, 2012

**REFERENCE BOOKS:**

- R1** Koontz & wehrich – Essentials of management, TMH, 10th edition, 2015
- R2** Stoner, Freeman, Gilbert, Management, 6th edition Pearson education, New Delhi, 20
- R3** O.P. Khana, Industrial engineering and Management L.S.Srinath, PERT & CPM

## **PART-B**

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

#### **UNIT-I: INTRODUCTION**

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.	Management-Nature and Importance	1	25-06-2024		TLM1/TLM2	
2.	Management functions	1	26.06-2024		TLM1/TLM2	
3.	Contributions of Taylor, Fayol	1	27.06.2024		TLM1/TLM2	
4.	Contribution of Elton Mayo	1	28.06.2024		TLM1/TLM2	
5.	Maslow's & Herzberg's Two Factor Theory	1	02.07.2024		TLM1/TLM2	
6.	Douglas McGregor	1	03.07.2024		TLM1/TLM2	
7.	Basic Concepts of Organization- Authority	1	04.07.2024		TLM1/TLM2	
8.	Responsibility Delegation of Authority	1	05.07.2024		TLM1/TLM2	
9.	Departmentation and Decentralization	1	09.07.2024		TLM1/TLM2	
10.	Span of Control	1	10.07.2024		TLM1/TLM2	
11.	Line, Line and Staff organizations	1	11.07.2024		TLM1/TLM2	
12.	Functional, Committee	1	12.07.2024		TLM1/TLM2	
13.	Matrix Organizations	1	16.07.2024		TLM1/TLM2	
14.	Quiz-I	1	18.07.2024		TLM1/TLM2	
<b>No. of classes required to complete UNIT-I: 14</b>				<b>No. of classes taken:</b>		

#### **UNIT-II: OPERATIONS MANAGEMENT**

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
15.	Plant location	1	19.07.2024		TLM1/TLM2	
16.	Factors influencing location	1	23.07.2024		TLM1/TLM2	
17.	Principles	1	24.07.2024		TLM1/TLM2	
18.	Types of plant layouts	1	25.07.2024		TLM1/TLM2	
19.	Methods of production (job, batch production)	1	26.07.2024		TLM1/TLM2	
20.	Mass production	1	30.07.2024		TLM1/TLM2	
21.	Work study - Basic procedure involved in method study and Work measurement	1	31.07.2024		TLM1/TLM2	
22.	Work study - Basic procedure involved in method study and Work measurement	1	01.08.2024		TLM1/TLM2	

23.	Quiz-II	1	02.08.2024		TLM1/TLM2	
<b>No. of classes required to complete UNIT-II: 09</b>				<b>No. of classes taken:</b>		

### UNIT-III: STATISTICAL QUALITY CONTROL, MATERIALS MANAGEMENT

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
24.	Statistical quality control Introduction	1	06.08.2024		TLM1/TLM2	
25.	Concept of Quality & Quality Control	1	07.08.2024		TLM1/TLM2	
26.	Functions, Meaning of SQC	1	08.08.2024		TLM1/TLM2	
27.	Variables and attributes	1	09.08.2024		TLM1/TLM2	
28.	X chart	1	13.08.2024		TLM1/TLM2	
29.	R Chart	1	14.08.2024		TLM1/TLM2	
30.	C Chart	1	16.08.2024		TLM1/TLM2	
31.	P Chart	1	20.08.2024		TLM1/TLM2	
32.	Simple Problems	1	21.08.2024		TLM1/TLM2	
33.	Acceptance sampling	1	22.08.2024		TLM1/TLM2	
34.	Sampling plans	1	23.08.2024		TLM1/TLM2	
35.	Deming's contribution to quality	1	27.08.2024		TLM1/TLM2	
36.	Materials management	1	28.08.2024		TLM1/TLM2	
37.	Meaning and objectives	1	29.08.2024		TLM1/TLM2	
38.	Inventory control	1	30.08.2024		TLM1/TLM2	
39.	Need for inventory control	1	10.09.2024		TLM1/TLM2	
40.	Purchase procedure	1	11.09.2024		TLM1/TLM2	
41.	Store records	1	12.09.2024		TLM1/TLM2	
42.	EOQ, ABC analysis	1	13.09.2024		TLM1/TLM2	
43.	Stock levels	1	17.09.2024		TLM1/TLM2	
44.	Quiz-3	1	18.09.2024		TLM1/TLM2	
<b>No. of classes required to complete UNIT-III: 15</b>				<b>No. of classes taken:</b>		

### UNIT-IV: HUMAN RESOURCE MANAGEMENT (HRM)

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
45.	Concepts of HRM	1	19.09.2024		TLM1/TLM2	
46.	Basic functions of HR manager	1	20.09.2024		TLM1/TLM2	
47.	Man power planning	1	24.09.2024		TLM1/TLM2	
48.	Recruitment	1	25.09.2024		TLM1/TLM2	
49.	Selection	1	26.09.2024		TLM1/TLM2	



50.	Training and development	1	27.09.2024		TLM1/TLM2	
51.	Placement	1	01.10.2024		TLM1/TLM2	
52.	Wage and salary administration	1	03.10.2024		TLM1/TLM2	
53.	Wage and salary administration	1	04.10.2024		TLM1/TLM2	
54.	Promotion	1	08.10.2024		TLM1/TLM2	
55.	Transfers Separation	1	09.10.2024		TLM1/TLM2	
56.	Performance appraisal	1	10.10.2024		TLM1/TLM2	
57.	Job evaluation and merit rating	1	15.10.2024		TLM1/TLM2	
58.	Quiz-4	1	16.10.2024		TLM1/TLM2	
<b>No. of classes required to complete UNIT-IV: 14</b>				<b>No. of classes taken:</b>		

### UNIT-V: PROJECT MANAGEMENT

S. No	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
59.	Introduction	1	17.10.2024		TLM1/TLM2	
60.	Early techniques in project management	1	17.10.2024		TLM1/TLM2	
61.	Network analysis	1	18.10.2024		TLM1/TLM2	
62.	Programme Evaluation and Review Technique (PERT)	1	22.10.2024		TLM1/TLM2	
63.	Problems	1	22.10.2024		TLM1/TLM2	
64.	Critical path method (CPM)	1	23.10.2024		TLM1/TLM2	
65.	Identifying critical path	1	24.10.2024		TLM1/TLM2	
66.	Problems	1	25.10.2024		TLM1/TLM2	
67.	Problems	1	29.10.2024		TLM1/TLM2	
68.	Probability of completing project within given time	1	30.10.2024		TLM1/TLM2	
69.	Project cost analysis	1	01.11.2024		TLM1/TLM2	
70.	Problems	1	05.11.2024		TLM1/TLM2	
71.	project crashing	1	06.11.2024		TLM1/TLM2	
72.	Simple problems	1	07.11.2024		TLM1/TLM2	
73.	Simple problems	1	08.11.2024		TLM1/TLM2	
<b>No. of classes required to complete UNIT-V: 14</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
Assignment-I (Units-I, II & UNIT-III (Half of the Syllabus))	A1=5
I-Descriptive Examination (Units-I, II & UNIT-III (Half of the Syllabus))	M1=15

I-Quiz Examination (Units-I, II & UNIT-III (Half of the Syllabus))	Q1=10
Assignment-II (Unit-III (Remaining Half of the Syllabus), IV & V)	A2=5
II- Descriptive Examination (UNIT-III (Remaining Half of the Syllabus), IV & V)	M2=15
II-Quiz Examination (UNIT-III (Remaining Half of the Syllabus), IV & V)	Q2=10
Mid Marks =80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE): M	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

## PART-D

### PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):

<b>PEO 1</b>	To build a professional career and pursue higher studies with sound knowledge in Mathematics, Science and Mechanical Engineering.
<b>PEO 2</b>	To inculcate strong ethical values and leadership qualities for graduates to become successful in multidisciplinary activities.
<b>PEO 3</b>	To develop inquisitiveness towards good communication and lifelong learning.

### PROGRAMME OUTCOMES (POs):

<b>PO 1</b>	<b>Engineering knowledge:</b> Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
<b>PO 2</b>	<b>Problem analysis:</b> Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
<b>PO 3</b>	<b>Design/development of solutions:</b> Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
<b>PO 4</b>	<b>Conduct investigations of complex problems:</b> Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
<b>PO 5</b>	<b>Modern tool usage:</b> Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
<b>PO 6</b>	<b>The engineer and society:</b> Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
<b>PO 7</b>	<b>Environment and sustainability:</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>PO 8</b>	<b>Ethics:</b> Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
<b>PO 9</b>	<b>Individual and team work:</b> Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

<b>PO 10</b>	<b>Communication:</b> Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
<b>PO 11</b>	<b>Project management and finance:</b> Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
<b>PO 12</b>	<b>Life-long learning:</b> Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

### PROGRAMME SPECIFIC OUTCOMES (PSOs):

<b>PSO 1</b>	To apply the principles of thermal sciences to design and develop various thermal systems.
<b>PSO 2</b>	To apply the principles of manufacturing technology, scientific management towards improvement of quality and optimization of engineering systems in the design, analysis and manufacturability of products.
<b>PSO 3</b>	To apply the basic principles of mechanical engineering design for evaluation of performance of various systems relating to transmission of motion and power, conservation of energy and other process equipment

<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>	Ms. P. Mounika	Dr. A.Nageswara Rao	Mr. J. Subba Reddy	Dr.M.B.S.Sreekara Reddy
<b>Signature</b>				



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Phone: 08659-222933, Fax: 08659-222931

## DEPARTMENT OF INFORMATION AND TECHNOLOGY

### COURSE HANDOUT PART-A

**Name of Course Instructor:** Ms. P. Mounika, Assistant Professor,

Mechanical Engineering.

**Course Name & Code** : MANAGEMENT SCIENCE FOR  
ENGINEERS & 20HS02

**Regulation:** R20

**L-T-P Structure** : 3-0-0

**Credits:** 03

**Program/Sem/Sec** : B.Tech VII Sem (IT - B)

**A.Y.:** 2024-2025

**PREREQUISITE:** Professional ethics and human values

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

1. To make students understand management, its principles, contribution to management, organization, and its basic issues and types.
2. To make students understand the concept of plant location and its factors and plant layout and types, method of production and work study importance.
3. To understand the purpose and function of statistical quality control. And understand the material management techniques.

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

<b>CO1</b>	Understand management principles to practical situations based on the organization structures. (L2)
<b>CO2</b>	Design Effective plant Layouts by using work study methods. (L2)
<b>CO3</b>	Apply quality control techniques for improvement of quality and materials management. (L3)
<b>CO4</b>	Develop best practices of HRM in corporate Business to raise employee productivity. (L2)
<b>CO5</b>	Identify critical path and project completion time by using CPM and PERT techniques. (L3)

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

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
<b>CO1</b>	3	-	-	-	-	-	-	2	2	-	-	3	-	-	-
<b>CO2</b>	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-
<b>CO3</b>	-	3	-	-	-	-	-	-	-	-	-	3	-	-	-
<b>CO4</b>	-	-	-	-	-	-	-	3	2	-	-	3	-	-	-
<b>CO5</b>	-	-	-	-	-	-	-	-	-	-	2	3	-	-	-
	1 - Low				2 - Medium				3 - High						

<b>PSO 1</b>	To apply the principles of thermal sciences to design and develop various thermal systems.
<b>PSO 2</b>	To apply the principles of manufacturing technology, scientific management towards improvement of quality and optimization of engineering systems in the design, analysis and manufacturability of products.
<b>PSO 3</b>	To apply the basic principles of mechanical engineering design for evaluation of performance of various systems relating to transmission of motion and power, conservation of energy and other process equipment.

**TEXTBOOKS:**

**T1** Dr. A.R.Aryasri, Management Science, TMH, 10th edition, 2012

**REFERENCE BOOKS:**

- R1** Koontz & wehrich – Essentials of management, TMH, 10th edition, 2015
- R2** Stoner, Freeman, Gilbert, Management, 6th edition Pearson education, New Delhi, 20
- R3** O.P. Khana, Industrial engineering and Management L.S.Srinath, PERT & CPM

## **PART-B**

### **COURSE DELIVERY PLAN (LESSON PLAN): Section - B**

#### **UNIT-I: INTRODUCTION**

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.	Management-Nature and Importance	1	24.06.2024		TLM1/TLM2	
2.	Management functions	1	27.06.2024		TLM1/TLM2	
3.	Contributions of Taylor, Fayol	1	28.06.2024		TLM1/TLM2	
4.	Contribution of Elton Mayo	1	29.06.2024		TLM1/TLM2	
5.	Maslow's & Herzberg's Two Factor Theory	1	01.07.2024		TLM1/TLM2	
6.	Douglas McGregor	1	04.07.2024		TLM1/TLM2	
7.	Basic Concepts of Organization-Authority	1	05.07.2024		TLM1/TLM2	
8.	Responsibility Delegation of Authority	1	06.07.2024		TLM1/TLM2	
9.	Departmentation and Decentralization	1	08.07.2024		TLM1/TLM2	
10.	Span of Control	1	11.07.2024		TLM1/TLM2	
11.	Line, Line and Staff organizations	1	12.07.2024		TLM1/TLM2	
12.	Functional, Committee	1	15.07.2024		TLM1/TLM2	
13.	Matrix Organizations	1	18.07.2024		TLM1/TLM2	
14.	Quiz-I	1	19.07.2024		TLM1/TLM2	
<b>No. of classes required to complete UNIT-I: 14</b>				<b>No. of classes taken:</b>		

#### **UNIT-II: OPERATIONS MANAGEMENT**

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
15.	Plant location	1	20.07.2024		TLM1/TLM2	
16.	Factors influencing location	1	22.07.2024		TLM1/TLM2	
17.	Principles	1	25.07.2024		TLM1/TLM2	
18.	Types of plant layouts	1	26.07.2024		TLM1/TLM2	
19.	Methods of production (job, batch production)	1	27.07.2024		TLM1/TLM2	
20.	Mass production	1	29.07.2024		TLM1/TLM2	
21.	Work study - Basic procedure involved in method study and Work measurement	1	01.08.2024		TLM1/TLM2	
22.	Work study - Basic procedure involved in method study and Work measurement	1	02.08.2024		TLM1/TLM2	

23.	Quiz-II	1	03-08-2024		TLM1/TLM2	
<b>No. of classes required to complete UNIT-II: 09</b>				<b>No. of classes taken:</b>		

### UNIT-III: STATISTICAL QUALITY CONTROL, MATERIALS MANAGEMENT

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
24.	Statistical quality control Introduction	1	05.08.2024		TLM1/TLM2	
25.	Concept of Quality & Quality Control	1	08.08.2024		TLM1/TLM2	
26.	Functions, Meaning of SQC	1	09.08.2024		TLM1/TLM2	
27.	Variables and attributes	1	12.08.2024		TLM1/TLM2	
28.	X chart	1	16.08.2024		TLM1/TLM2	
29.	R Chart	1	17.08.2024		TLM1/TLM2	
30.	C Chart	1	19.08.2024		TLM1/TLM2	
31.	P Chart	1	22.08.2024		TLM1/TLM2	
32.	Simple Problems	1	23.08.2024		TLM1/TLM2	
33.	Acceptance sampling	1	24.08.2024		TLM1/TLM2	
34.	Sampling plans	1	29.08.2024		TLM1/TLM2	
35.	Deming's contribution to quality	1	30.08.2024		TLM1/TLM2	
36.	Materials management	1	31.08.2024		TLM1/TLM2	
37.	Meaning and objectives	1	09.09.2024		TLM1/TLM2	
38.	Inventory control	1	09.09.2024		TLM1/TLM2	
39.	Need for inventory control	1	12.09.2024		TLM1/TLM2	
40.	Purchase procedure	1	12.09.2024		TLM1/TLM2	
41.	Store records	1	13.09.2024		TLM1/TLM2	
42.	EOQ, ABC analysis	1	13.09.2024		TLM1/TLM2	
43.	Stock levels	1	19.09.2024		TLM1/TLM2	
44.	Quiz-3	1	19.09.2024		TLM1/TLM2	
<b>No. of classes required to complete UNIT-III: 15</b>				<b>No. of classes taken:</b>		

### UNIT-IV: HUMAN RESOURCE MANAGEMENT (HRM)

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
45.	Concepts of HRM	1	20.09.2024		TLM1/TLM2	
46.	Basic functions of HR manager	1	21.09.2024		TLM1/TLM2	
47.	Man power planning	1	23.09.2024		TLM1/TLM2	
48.	Recruitment	1	26.09.2024		TLM1/TLM2	
49.	Selection	1	26.09.2024		TLM1/TLM2	

50.	Training and development	1	27.09.2024		TLM1/TLM2	
51.	Placement	1	28.09.2024		TLM1/TLM2	
52.	Wage and salary administration	1	30.09.2024		TLM1/TLM2	
53.	Wage and salary administration	1	03.10.2024		TLM1/TLM2	
54.	Promotion	1	04.10.2024		TLM1/TLM2	
55.	Transfers Separation	1	05.10.2024		TLM1/TLM2	
56.	Performance appraisal	1	07.10.2024		TLM1/TLM2	
57.	Job evaluation and merit rating	1	10.10.2024		TLM1/TLM2	
58.	Quiz-4	1	14.10.2024		TLM1/TLM2	
<b>No. of classes required to complete UNIT-IV: 14</b>				<b>No. of classes taken:</b>		

### UNIT-V: PROJECT MANAGEMENT

S. No	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
59.	Introduction	1	17.10.2024		TLM1/TLM2	
60.	Early techniques in project management	1	18.10.2024		TLM1/TLM2	
61.	Network analysis	1	19.10.2024		TLM1/TLM2	
62.	Programme Evaluation and Review Technique (PERT)	1	21.10.2024		TLM1/TLM2	
63.	Problems	1	24.10.2024		TLM1/TLM2	
64.	Critical path method (CPM)	1	25.10.2024		TLM1/TLM2	
65.	Identifying critical path	1	26.10.2024		TLM1/TLM2	
66.	Problems	1	28.10.2024		TLM1/TLM2	
67.	Problems	1	01.11.2024		TLM1/TLM2	
68.	Probability of completing project within given time	1	02.11.2024		TLM1/TLM2	
69.	Project cost analysis	1	04.11.2024		TLM1/TLM2	
70.	Problems	1	07.11.2024		TLM1/TLM2	
71.	project crashing	1	08.11.2024		TLM1/TLM2	
72.	Simple problems	1	08.11.2024		TLM1/TLM2	
73.	Simple problems	1	09.11.2024		TLM1/TLM2	
<b>No. of classes required to complete UNIT-V: 14</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
Assignment-I (Units-I, II & UNIT-III (Half of the Syllabus))	A1=5
I-Descriptive Examination (Units-I, II & UNIT-III (Half of the Syllabus))	M1=15



I-Quiz Examination (Units-I, II & UNIT-III (Half of the Syllabus))	Q1=10
Assignment-II (Unit-III (Remaining Half of the Syllabus), IV & V)	A2=5
II- Descriptive Examination (UNIT-III (Remaining Half of the Syllabus), IV & V)	M2=15
II-Quiz Examination (UNIT-III (Remaining Half of the Syllabus), IV & V)	Q2=10
Mid Marks =80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE): M	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

## PART-D

### PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):

<b>PEO 1</b>	To build a professional career and pursue higher studies with sound knowledge in Mathematics, Science and Mechanical Engineering.
<b>PEO 2</b>	To inculcate strong ethical values and leadership qualities for graduates to become successful in multidisciplinary activities.
<b>PEO 3</b>	To develop inquisitiveness towards good communication and lifelong learning.

### PROGRAMME OUTCOMES (POs):

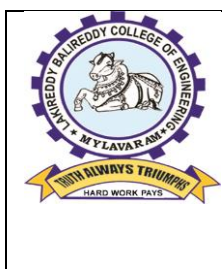
<b>PO 1</b>	<b>Engineering knowledge:</b> Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
<b>PO 2</b>	<b>Problem analysis:</b> Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
<b>PO 3</b>	<b>Design/development of solutions:</b> Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
<b>PO 4</b>	<b>Conduct investigations of complex problems:</b> Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
<b>PO 5</b>	<b>Modern tool usage:</b> Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
<b>PO 6</b>	<b>The engineer and society:</b> Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
<b>PO 7</b>	<b>Environment and sustainability:</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>PO 8</b>	<b>Ethics:</b> Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
<b>PO 9</b>	<b>Individual and team work:</b> Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

<b>PO 10</b>	<b>Communication:</b> Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
<b>PO 11</b>	<b>Project management and finance:</b> Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
<b>PO 12</b>	<b>Life-long learning:</b> Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

**PROGRAMME SPECIFIC OUTCOMES (PSOs):**

<b>PSO 1</b>	To apply the principles of thermal sciences to design and develop various thermal systems.
<b>PSO 2</b>	To apply the principles of manufacturing technology, scientific management towards improvement of quality and optimization of engineering systems in the design, analysis and manufacturability of products.
<b>PSO 3</b>	To apply the basic principles of mechanical engineering design for evaluation of performance of various systems relating to transmission of motion and power, conservation of energy and other process equipment

<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>	Ms. P. Mounika	Dr. A.Nageswara Rao	Mr. J. Subba Reddy	Dr.M.B.S.Sreekara Reddy
<b>Signature</b>				



**LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING  
(AUTONOMOUS)**

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Accredited By NAAC, Accredited By NBA Tier-I & Certified by ISO 9001:2015  
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**DEPARTMENT OF INFORMATION TECHNOLOGY**

PROGRAM : B.Tech, VII-Sem, IT – R20 Regulation  
ACADEMIC YEAR : 2024-25  
COURSE NAME & CODE : NLP Tool Kit (20ITS4)  
L-T-P STRUCTURE : 1-0-2  
COURSE CREDITS : 2  
COURSE INSTRUCTOR : Dr.AVN Reddy

**Course Educational Objective:** This course also covers basis of semantic analysis and discourse analysis and drives it to machine translation. This NLP course will boost student knowledge to research level where they can conduct new level of research. It really helpful for undergraduate students.

**Course Outcomes (CO):** At the end of this course, the student will be able to:

<b>CO1:</b>	Apply the appropriate pre-processing techniques on text. (Apply – L3)
<b>CO2:</b>	Implement algorithm for Semantics and Sentiment analysis using NLP. (Apply –L3)
<b>CO3:</b>	Explore various application of NLP (Understanding – L2)
<b>CO 4:</b>	Improve individual / teamwork skills, communication & report writing skills with ethical values.

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

COs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
<b>CO1</b>	2	2	-	-	3	-	-	-	-	-	-	2	2	-	-
<b>CO2</b>	3	2	-	-	-	-	-	-	-	-	-	-	1	-	-
<b>CO3</b>	2	-	3	3	-	-	-	-	-	-	-	-	2	-	-
<b>CO4</b>	-	2	3	-	3	-	-	2	1	-	-	-	2	-	-

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

**COURSE DELIVERY PLAN (LESSON PLAN): Section-A, B**

<b>S.N O</b>	<b>Date</b>	<b>List Of Programmes</b>	<b>Signature</b>
1	A: 24.06.2024 B: 26.06.2024	Installation and Downloading of NLTK on Windows/Mac.	
2	A: 01.07.2024 B: 03.07.2024	NLTK Tokenize: Words and Sentences Tokenizer with Example.	
3	A: 08.07.2024 B: 10.07.2024	Pre-processing of text (Tokenization, Filtration, Script Validation, Stop Word Removal, Lower case conversion, Stemming).	
4	A: 15.07.2024 B: 17.07.2024	Word Analysis. Virtual Lab Experiments	
5	A: 22.07.2024 B: 24.07.2024	Word Generation. Virtual Lab Experiments	
6	A: 29.07.2024 B: 31.07.2024	Parse tree or Syntax Tree generation, Virtual Lab Experiments	
7	A: 05.08.2024 B: 07.08.2024	N-gram model, Virtual Lab Experiments	
8	A: 12.08.2024 B: 14.08.2024	POS tagging. Virtual Lab Experiments	
9	A: 19.08.2024 B: 21.08.2024	Chunking. Virtual Lab Experiments	
10	A: 26.08.2024 B: 28.08.2024	Named Entity Recognition. Virtual Lab Experiments	
11	A: 09.09.2024 B: 11.09.2024	Implement text processing with neural network, Virtual Lab Experiments	
12	A: 16.09.2024 B: 18.09.2024	Implement text processing with LSTM. Virtual Lab Experiments	
13	A: 23.09.2024 B: 25.09.2024	Virtual Lab Experiments	
14	A: 30.09.2024 B: 02.10.2024	Virtual Lab Experiments	
15	A: 07.10.2024 B: 09.10.2024	Virtual Lab Experiments	
16	A: 14.10.2024 B: 16.10.2024	Virtual Lab Experiments	
17	A: 21.10.2024 B: 23.10.2024	Virtual Lab Experiments	
18	A: 28.10.2024 B: 30.10.2024	Virtual Lab Experiments	
19	A: 04.11.2024 B: 06.11.2024	Virtual Lab Experiments	

**ACADEMIC CALENDAR:**

<b>Description</b>	<b>From</b>	<b>To</b>	<b>Weeks</b>
Commencement of Class Work	24.06.2024		
I Phase of Instructions	24.06.2024	31.08.2024	8W
I Mid Examinations	<b>02.09.2024</b>	<b>07.09.2024</b>	1W
II Phase of Instructions	09.09.2024	09.11.2024	8W
II Mid Examinations	<b>11.11.2024</b>	<b>16.11.2024</b>	1W
Preparation and Practical's	18.11.2024	23.11.2024	1 W
Semester End Examinations	25.11.2024	07.12.202	2 W

Dr.AVN Reddy	Dr.AVN Reddy	Mrs.M.Hema Latha	Dr.B.Srinivasa Rao
<b>Course Instructor</b>	<b>Coordinator</b>	<b>Module Coordinator</b>	<b>Head of the Department</b>