



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: CH. POORNA VENKATA SRINIVASA RAO

Course Name & Code : DEEP LEARNING & 20AD07

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

Credits: 3

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

A.Y.: 2023-24

PREREQUISITE: Probability and Statistics, LATT, Machine Learning.

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

CO1	Apply the fundamentals of linear algebra to machine learning algorithms. (Apply- L3)
CO2	Understand the fundamental building blocks of deep learning. (Understand- L2)
CO3	Apply the concepts of Convolutional Neural Networks to computer vision applications. (Apply- L3)
CO4	Apply the concepts of Recurrent Neural Networks to Natural Language Processing. (Apply- L3)
CO5	Apply the regularization techniques to improve the model performance. (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
CO1	2	3	1										3	2	
CO2	2	3	1										3	2	
CO3	2	3	1										3	2	
CO4	2	3	1										3	2	
CO5	2	3	1										3	2	
			1 - Low			2 -Medium			3 - High						

TEXTBOOKS:

T1. Deep Learning, Ian Goodfellow, YoshuaBengio and Aaron Courville, MIT Press, 2016.

T2. Deep Learning with Python, Francois Chollet, Manning Publications, Released December 2017.

T3. Deep Learning Illustrated: A Visual, Interactive Guide to Artificial Intelligence – Jon Krohn, Grant Beyleveld, AglaéBassens, Released September 2019, Publisher(s): Addison-Wesley Professional, ISBN: 9780135116821.

T4. Deep Learning from Scratch - Seth Weidman, Released September 2019, Publisher(s): O'Reilly Media, Inc., ISBN: 9781492041412.

REFERENCE BOOKS:

R1 Artificial Neural Networks, Yegnanarayana, B., PHI Learning Pvt. Ltd, 2009.

R2 Matrix Computations, Golub, G.,H., and Van Loan,C.,F, JHU Press,2013.

R3 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.	Introduction	1	10-07-2023		TLM1	
2.	Scalars	1	12-07-2023		TLM1	
3.	Vectors	1	13-07-2023		TLM1	
4.	Matrices	1	14-07-2023		TLM1	
5.	Tensors	1	17-07-2023		TLM1	
6.	Multiplying Matrices	1	19-07-2023		TLM1	
7.	Multiplying Vectors	1	20-07-2023		TLM1	
8.	Identity Matrices	1	21-07-2023		TLM1	
9.	Inverse Matrices	1	24-07-2023		TLM1	
10.	Linear dependence	1	26-07-2023		TLM1	
11.	span	1	27-07-2023		TLM1	
12.	Norms	1	28-07-2023		TLM1	
13.	Special kinds of vectors	1	31-07-2023		TLM1	
14.	Special kinds of matrices	1	02-08-2023		TLM1	
15.	Trace operations	1	03-08-2023		TLM1	
16.	Eigen value decomposition	2	04-08-2023		TLM1	
No. of classes required to complete UNIT-I: 17				No. of classes taken:		

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
17.	Anatomy of Neural Networks	1	07-08-2023		TLM1	
18.	Layers	1	09-08-2023		TLM1	
19.	Models	1	10-08-2023		TLM1	
20.	Loss functions	1	11-08-2023		TLM1	
21.	ANN Optimizers	1	14-08-2023		TLM1	
22.	Training Deep Networks	1	16-08-2023		TLM1	

23.	Cost Functions	1	17-08-2023		TLM1	
24.	Optimizers	1	18-08-2023		TLM1	
25.	Types of Deep Neural Networks	2	21-08-2023 To 23-08-2023		TLM1	
No. of classes required to complete UNIT-II: 10				No. of classes taken:		

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
26.	Convolutional Neural Networks	1	24-08-2023		TLM1	
27.	Motivation	1	25-08-2023		TLM1	
28.	Convolution Operation	2	04-09-2023 To 07-09-2023		TLM1	
29.	Types of layers	2	08-09-2023		TLM1	
30.	Pooling	1	11-09-2023		TLM1	
31.	LENET5 Architecture	2	13-09-2023 To 14-09-2023		TLM1	
No. of classes required to complete UNIT-III: 09				No. of classes taken:		

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
32.	Recurrent Neural Networks	1	15-09-2023		TLM1	
33.	Architecture of traditional RNN	1	20-09-2023		TLM1	
34.	Types of RNN	2	21-09-2023 To 22-09-2023		TLM1	
35.	Applications of RNN	2	25-09-2023 To 27-09-2023		TLM1	
36.	Variants of RNNs	1	29-09-2023		TLM1	
37.	Word Embedding using Word2vec	2	04-10-2023 To 05-10-2023		TLM1	
No. of classes required to complete UNIT-IV: 09				No. of classes taken:		

UNIT-V: Regularization and Autoencoders

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
38.	Regularization for Deep Learning	1	06-10-2023		TLM1	

39.	L1 and L2	1	09-10-2023		TLM2	
40.	Dropout	1	11-10-2023		TLM2	
41.	Data Augmentation	1	12-10-2023		TLM2	
42.	Early Stopping	1	13-10-2023		TLM2	
43.	Case study on MNIST data	2	16-10-2023 To 18-10-2023		TLM2	
44.	Autoencoders	1	19-10-2023		TLM2	
45.	Architecture	1	20-10-2023		TLM2	
46.	Implementation	1	25-10-2023		TLM2	
47.	Denosing Autoencoders	1	26-10-2023		TLM2	
48.	Sparse Autoencoders	1	27-10-2023		TLM2	
49.	Use cases	2	28-10-2023		TLM2	
No. of classes required to complete UNIT-V: 14				No. of classes taken:		

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.	Linear Algebra	1	10-07-2023		TLM1	
2.	Linear Transformation	1	03-08-2023		TLM1	

Teaching Learning Methods

TLM1	Chalk and Talk	TLM4	Demonstration (Lab/Field Visit)
TLM2	PPT	TLM5	ICT (NPTEL/Swayam Prabha/MOOCs)
TLM3	Tutorial	TLM6	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	Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	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.
PO 3	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.
PO 4	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.
PO 5	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.
PO 6	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.
PO 7	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.
PO 8	Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	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.
PO 11	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.
PO 12	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):

PSO 1	The ability to apply Software Engineering practices and strategies in software project development using open-source programming environment for the success of Organization.
PSO 2	The 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.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Mr. Ch. Poorna Venkata Srinivasa Rao	Mr.K.Rajasekhar	Mrs.M.Hemalatha	Dr.B.Srinivasa Rao
Signature				



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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.: 2023-24

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

C01	Describe the preliminaries of Artificial intelligence and Neural networks. (Understand - L2)
C02	Map the issues to AI-based solutions. (Apply - L3)
C03	Apply Soft computing techniques to solve real world problems. (Apply – L3)
C04	Implement systems based on fuzzy logic. (Apply – L3)
C05	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	
C01	2	-	-	2	-	-	-	-	-	-	-	-	-	2	-	
C02	3	2	-	2	-	-	-	-	-	-	-	-	1	2	-	
C03	2	3	2	2	-	-	-	-	-	-	-	-	-	2	-	
C04	2	2	-	2	-	-	-	-	-	-	-	-	2	2	-	
C05	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:

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

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	03/07/23		TLM1	
2.	Architecture: Neuron, Nerve structure and synapse	1	04/07/23		TLM1	
3.	Artificial Neuron and its model	1	05/07/23		TLM1	
4.	activation functions	2	07/07/23 10/07/23		TLM1	
5.	Neural network architecture: single layer and multi-layer feed forward networks,	1	11/07/23		TLM1	
6.	recurrent networks	1	12/07/23		TLM1	
7.	Various learning techniques; perception rule	1	13/07/23		TLM1	
8.	convergence rule	1	14/07/23		TLM1	
9.	Associative Memory	1	17/07/23		TLM1	
10.	Auto-associative	1	18/07/23		TLM1	
11.	Hetero-associative memory.	1	19/07/23		TLM1	
12.	Derivative of Activation Functions.	2	20/07/23 21/07/23		TLM1	
13.	Numericals on Activation Functions.	2	24/07/23,25/07/23		TLM1	
14.	Numericals on Neural Networks.	2	26/07/23, 27/07/23		TLM1	
No. of classes required to complete UNIT-I: 18				No. of classes taken:		

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	28/07/23		TLM1	
16.	single layer artificial neural network,	1	31/07/23		TLM1	
17.	multi-layer perception model	1	01/08/23		TLM1	
18.	back propagation learning methods	2	02/08/23, 03/08/23		TLM1	
19.	effect of learning rule co-efficient	1	04/08/23		TLM1	
20.	back propagation algorithm,	2	07/08/23, 08/08/23		TLM1	

21.	factors affecting back propagation training	1	09/08/23		TLM1	
22.	applications	1	10/08/23		TLM1	
23.	Numericals on back propagation algorithm	2	11/08/23 14/08/23		TLM1	
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	16/08 ,17/08		TLM1	
25.	Fuzzy sets and Crisp sets	2	18/08 21/08		TLM1	
26.	Fuzzy set theory	1	22/08		TLM1	
27.	operations	1	23/08		TLM1	
28.	Properties of fuzzy sets	2	24/08 25/08		TLM1	
29.	Fuzzy and Crisp relations	2	04/09 05/09		TLM1	
30.	Fuzzy to Crisp conversion	1	07/09		TLM1	
31.	Fuzzy relations	2	08/09 11/09		TLM1	
32.	rules, propositions	1	12/09		TLM1	
33.	implications, and inferences	1	13/09		TLM1	
34.	Defuzzification techniques.	2	14/09 15/09		TLM1	
35.	applications of Fuzzy logic	1	19/09		TLM1	
No. of classes required to complete UNIT-III:18				No. of classes taken:		

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	20/9		TLM1	
37.	interference in fuzzy logic	1	21/09		TLM1	
38.	fuzzy if-then rules	1	22/09		TLM1	
39.	Fuzzy implications and Fuzzy algorithms	2	25/09 26/09		TLM1	
40.	Fuzzifications & Defuzzification.	2	27/09 29/09		TLM1	
41.	Fuzzywuzzy Python library	1	03/10		TLM1	
42.	String Pattern Matching using Levenstein Algorithm	1	04/10			
No. of classes required to complete UNIT-IV: 09				No. of classes taken:		

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"	2	05/10 06/10		TLM1	
44.	application to probabilistic search techniques	1	09/10		TLM2	
45.	Basic GA framework	2	10/10 11/10		TLM2	
46.	different GA architectures	1	12/10		TLM2	
47.	Encoding	1	13/10		TLM2	
48.	Crossover	1	16/10		TLM2	
49.	Selection	1	17/10		TLM2	
50.	Mutation	1	18/10		TLM2	
51.	Solving single-objective optimization problems using GAs	2	19/10 20/10		TLM2	
No. of classes required to complete UNIT-V: 12				No. of classes taken:		

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	2	24/10 25/10		TLM1	
2.	Use case on neural networks.	2	26/10 27/10		TLM1	

Teaching Learning Methods

TLM1	Chalk and Talk	TLM4	Demonstration (Lab/Field Visit)
TLM2	PPT	TLM5	ICT (NPTEL/Swayam Prabha/MOOCs)
TLM3	Tutorial	TLM6	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	Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	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.
PO 3	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.
PO 4	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.
PO 5	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.
PO 6	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.
PO 7	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.
PO 8	Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	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.
PO 11	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.
PO 12	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):

PSO 1	The ability to apply Software Engineering practices and strategies in software project development using open-source programming environment for the success of Organization.
PSO 2	The 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.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Mr K.Raviteja	Dr K.Phanindra	Dr K.Phanindra	Dr.B.Srinivasa Rao
Signature				



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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.: 2023-24

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

CO1	Describe the preliminaries of Artificial intelligence and Neural networks. (Understand - L2)
CO2	Map the issues to AI-based solutions. (Apply - L3)
CO3	Apply Soft computing techniques to solve real world problems. (Apply - L3)
CO4	Implement systems based on fuzzy logic. (Apply - L3)
CO5	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
CO1	2	-	-	2	-	-	-	-	-	-	-	-	-	2	-
CO2	3	2	-	2	-	-	-	-	-	-	-	-	1	2	-
CO3	2	3	2	2	-	-	-	-	-	-	-	-	-	2	-
CO4	2	2	-	2	-	-	-	-	-	-	-	-	2	2	-
CO5	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.
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R1	Laurene Fauseett, "Fundamentals of Neural Networks", Prentice Hall India, New Delhi, 1994.
R2	B. Yagna Narayana, "Artificial Neural Networks", PHI, 3rd Edition, 2009
R3	Simon O. Haykin, "Neural Networks and Learning Machines", Prentice Hall, 3rd Edition, 2009.
R4	https://pypi.org/project/fuzzywuzzy/

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	03/07/23		TLM1	
2.	Architecture: Neuron, Nerve structure and synapse	1	04/07/23		TLM1	
3.	Artificial Neuron and its model	1	06/07/23		TLM1	
4.	activation functions	2	07/07/23 08/07/23		TLM1	
5.	Neural network architecture: single layer and multi-layer feed forward networks,	1	10/07/23		TLM1	
6.	recurrent networks	1	11/07/23		TLM1	
7.	Various learning techniques; perception rule	1	13/07/23		TLM1	
8.	convergence rule	1	14/07/23		TLM1	
9.	Associative Memory	1	15/07/23		TLM1	
10.	Auto-associative	1	17/07/23		TLM1	
11.	Hetero-associative memory.	1	18/07/23		TLM1	
12.	Derivative of Activation Functions.	2	20/07/23 21/07/23		TLM1	
13.	Numericals on Activation Functions.	2	22/07/23,24/07/23		TLM1	
14.	Numericals on Neural Networks.	2	25/07/23, 27/07/23		TLM1	
No. of classes required to complete UNIT-I: 17				No. of classes taken:		

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	28/07/23		TLM1	
16.	single layer artificial neural network,	1	29/07/23		TLM1	
17.	multi-layer perception model	1	31/07/23		TLM1	
18.	back propagation learning methods	2	01/08/23, 03/08/23		TLM1	
19.	effect of learning rule co-efficient	1	04/08/23		TLM1	
20.	back propagation algorithm,	2	05/08/23, 07/08/23		TLM1	

21.	factors affecting back propagation training	1	08/08/23		TLM1	
22.	applications	1	10/08/23		TLM1	
23.	Numericals on back propagation algorithm	2	11/08/23 12/08/23		TLM1	
No. of classes required to complete UNIT-II: 10				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	14/08 17/08		TLM1	
25.	Fuzzy sets and Crisp sets	2	18/08 19/08		TLM1	
26.	Fuzzy set theory	1	21/08		TLM1	
27.	operations	1	22/08		TLM1	
28.	Properties of fuzzy sets	2	24/08 25/08		TLM1	
29.	Fuzzy and Crisp relations	2	26/09 04/09		TLM1	
30.	Fuzzy to Crisp conversion	1	05/09			
31.	Fuzzy relations	2	07/09 08/09			
32.	rules, propositions	1	11/09			
33.	implications, and inferences	1	12/09			
34.	Defuzzification techniques.	2	14/09 13/09			
35.	applications of Fuzzy logic	1	15/09			
No. of classes required to complete UNIT-III: 09				No. of classes taken:		

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	19/9		TLM1	
37.	interference in fuzzy logic	1	20/09		TLM1	
38.	fuzzy if-then rules	1	21/09		TLM1	
39.	Fuzzy implications and Fuzzy algorithms	2	25/09 22/09		TLM1	
40.	Fuzzifications & Defuzzification.	2	27/09 26/09		TLM1	
41.	Fuzzywuzzy Python library	1	29/09		TLM1	
42.	String Pattern Matching using Levenstein Algorithm	1	03/10			
No. of classes required to complete UNIT-IV: 09				No. of classes taken:		

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"	2	05/10 06/10		TLM1	
44.	application to probabilistic search techniques	1	07/10		TLM2	
45.	Basic GA framework	2	10/10 09/10		TLM2	
46.	different GA architectures	1	12/10		TLM2	
47.	Encoding	1	13/10		TLM2	
48.	Crossover	1	14/10		TLM2	
49.	Selection	1	16/10		TLM2	
50.	Mutation	1	17/10		TLM2	
51.	Solving single-objective optimization problems using GAs	2	19/10 20/10		TLM2	
No. of classes required to complete UNIT-V: 14				No. of classes taken:		

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	2	21/10 24/10		TLM1	
2.	Use case on neural networks.	2	26/10 27/10		TLM1	

Teaching Learning Methods

TLM1	Chalk and Talk	TLM4	Demonstration (Lab/Field Visit)
TLM2	PPT	TLM5	ICT (NPTEL/Swayam Prabha/MOOCs)
TLM3	Tutorial	TLM6	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	Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	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.
PO 3	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.
PO 4	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.
PO 5	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.
PO 6	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.
PO 7	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.
PO 8	Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	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.
PO 11	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.
PO 12	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):

PSO 1	The ability to apply Software Engineering practices and strategies in software project development using open-source programming environment for the success of Organization.
PSO 2	The 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.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Mr K.Raviteja	Dr K.Phanindra	Dr K.Phanindra	Dr.B.Srinivasa Rao
Signature				



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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 & B-Sec

A.Y. : 2023-24

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.

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

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	03-07-2023		TLM1	CO1	
2	Knowledge in Speech and Language Processing	2	04-07-2023 06-07-2023		TLM1	CO1	
3	Ambiguity; Models and Algorithms	2	07-07-2023 08-07-2023		TLM1	CO1	
4	Language, Thought and Understanding;	2	10-07-2023 11-07-2023		TLM1	CO1	
5	History Regular Expressions Regular Expression	2	13-07-2023 14-07-2023		TLM1	CO1	
6	Words; Corpora;	2	15-07-2023 17-07-2023		TLM1	CO1	
7	Text Normalization	2	18-07-2023 20-07-2023		TLM1	CO1	
8	Minimum Edit Distance	2	21-07-2023 22-07-2023		TLM1	CO1	
9	Unit-I Assignment Test	1	24-07-2023		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	25-07-2023 27-07-2023		TLM1	CO2		
11	Generalization and Zeros.	2	28-07-2023 31-07-2023		TLM1	CO2		
12	Smoothing: Laplace Smoothing	2	01-08-2023 03-08-2023		TLM1	CO2		
13	Add-k Smoothing	2	04-08-2023 05-08-2023		TLM1	CO2		
14	Backoff and Interpolation	2	07-08-2023 08-08-2023		TLM1	CO2		
15	Kneser-Ney Smoothing	2	10-08-2023 11-08-2023		TLM1	CO2		
16	Unit-II Assignment Test	1	12-08-2023		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	14-08-2023 17-08-2023		TLM1	CO3	
18	Tokenizing; Filtering Stop words; Stemming	2	18-08-2023 19-08-2023		TLM1	CO3	
19	Tagging parts of speech; Lemmatizing;	2	21-08-2023 22-08-2023		TLM1	CO3	
20	Chunking	2	24-08-2023 25-08-2023		TLM1	CO3	
21	Chinking Part-II: Using Named Entity Recognition (NER)	2	26-08-2023 04-09-2023		TLM1	CO3	
22	Getting Text to Analyze	2	05-09-2023 08-09-2023		TLM1	CO3	
23	Using a Concordance	2	09-09-2023 11-09-2023		TLM1	CO3	
24	Making a Dispersion Plot.	2	12-09-2023 14-09-2023		TLM1	CO3	
25	Unit-III Assignment Test	1	15-09-2023		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	16-09-2023 18-09-2023		TLM1	CO4	
27	Using Patterns to extract relations	2	21-09-2023 22-09-2023		TLM1	CO4	
28	Relation extraction via supervised learning	2	23-09-2023 25-09-2023		TLM1	CO4	
29	Semi supervised relation extraction via bootstrapping	2	26-09-2023 29-09-2023		TLM1	CO4	
30	Distant Supervision for Relation Extraction	2	30-09-2023 03-10-2023		TLM1	CO4	
31	Evaluation of Relation Extraction	2	05-10-2023		TLM1	CO4	
32	Extracting Times	2	06-10-2023		TLM1	CO4	
33	Extracting Events and their Times; Template Filling	2	07-10-2023 09-10-2023		TLM1	CO4	
34	Unit-III Assignment Test	1	10-10-2023		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	12-10-2023 13-10-2023		TLM1	CO5	
36	Relations between senses	2	14-10-2023 16-10-2023		TLM1	CO5	
37	WordNet: Sense relations in WordNet	2	17-10-2023 19-10-2023		TLM1	CO5	
38	Word Sense Disambiguation	1	20-10-2023		TLM1	CO5	
39	Alternate WSD algorithms and Tasks	1	26-10-2023		TLM1	CO5	
40	Post's correspondence problem,	1	27-10-2023		TLM1	CO5	
41	Undecidable problems about languages.	1	28-10-2023		TLM1	CO5	
No. of classes required to complete UNIT-5		10	No. of classes taken:				

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

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

PART-D

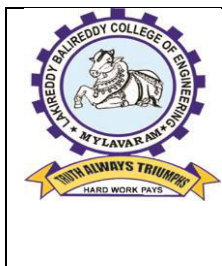
PROGRAMME OUTCOMES (POs):

PO 1	Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	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.
PO 3	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.
PO 4	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.
PO 5	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.
PO 6	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.
PO 7	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
PO 8	Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	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.
PO 11	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
PO 12	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):

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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DEPARTMENT OF INFORMATION TECHNOLOGY

PROGRAM : B.Tech, VII-Sem, IT – R20 Regulation
ACADEMIC YEAR : 2023-24
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:

CO1:	Apply the appropriate pre-processing techniques on text. (Apply – L3)
CO2:	Implement algorithm for Semantics and Sentiment analysis using NLP. (Apply –L3)
CO3:	Explore various application of NLP (Understanding – L2)
CO 4:	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
CO1	2	2	-	-	3	-	-	-	-	-	-	2	2	-	-
CO2	3	2	-	-	-	-	-	-	-	-	-	-	1	-	-
CO3	2	-	3	3	-	-	-	-	-	-	-	-	2	-	-
CO4	-	2	3	-	3	-	-	2	1	-	-	-	2	-	-

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

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

S.N O	Date	List Of Programmes	Signature
1	A: 04.07.2023 B: 07.07.2023	Installation and Downloading of NLTK on Windows/Mac.	
2	A: 11.07.2023 B: 14.07.2023	NLTK Tokenize: Words and Sentences Tokenizer with Example.	
3	A: 18.07.2023 B: 21.07.2023	Pre-processing of text (Tokenization, Filtration, Script Validation, Stop Word Removal, Lower case conversion, Stemming).	
4	A: 25.07.2023 B: 28.07.2023	Word Analysis.	
5	A: 01.08.2023 B: 04.08.2023	Word Generation.	
6	A: 08.08.2023 B: 11.08.2023	Parse tree or Syntax Tree generation	
7	A: 22.08.2023 B: 18.11.2023	N-gram model	
8	A: 12.09.2023 B: 08.09.2023	POS tagging.	
9	A: 26.09.2023 B: 15.09.2023	Chunking.	
10	A: 03.10.2023 B: 22.09.2023	Named Entity Recognition.	
11	A: 17.10.2023 B: 29.09.2023	Implement text processing with neural network	
12	A: 17.10.2023 B: 06.10.2023	Implement text processing with LSTM.	

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	1 W
Semester End Examinations	13.11.2023	25.11.2023	2 W

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



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DEPARTMENT OF INFORMATION TECHNOLOGY

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr. Phaneendra Kanakamedala

Course Name & Code : Blockchain Technologies, 20CS29

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

Credits: 03

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

A.Y. : 2023-24

PRE-REQUISITE: Information Security

COURSE EDUCATIONAL OBJECTIVES (CEOs): To understand block chain technology and Crypto currency works

CO1	Demonstrate the block chain basics, Crypto currency (Understand-L2)
CO2	Compare and contrast the use of different private vs. public block chain and use cases (Understand-L2)
CO3	Design an innovative Bit coin Block chain and scripts, Block chain Science on varies coins (Apply-L3)
CO4	Classify Permission Block chain and use cases – Hyper ledger, Corda (Analyze-L4)
CO5	Use of Block-chain in E-Governance, Land Registration, Medical Information Systems and others (Apply-L3)

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	3	2	1	-	-	-	-	-	-	-	-	-	-	2	-
CO2	3	2	1	1	-	-	-	-	-	-	-	1	-	2	-
CO3	2	3	1	1	-	-	-	-	-	-	-	-	-	2	-
CO4	3	2	1	-	-	-	-	-	-	-	-	-	-	2	-
CO5	1	3	1	-	-	-	-	-	-	-	-	1	-	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:

1. Block chain Blue print for Economy by Melanie Swan

REFERENCE BOOKS:

1. Block chain Basics: A Non-Technical Introduction in 25 Steps 1st Edition, by Daniel Drescher

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	Information on CO's and PO's of the Course & Syllabus	1	03-07-2023		TLM2	CO1	
2	Introduction to Blockchain	2	04-07-2023 06-07-2023		TLM2	CO1	
3	Basic Ideas Behind Blockchain	2	07-07-2023 08-07-2023		TLM2	CO1	
4	How Blockchain is changing the Landscape of Digitization	2	10-07-2023 11-07-2023		TLM2	CO1	
5	Introduction to Cryptography concepts required for Blockchain	2	13-07-2023 14-07-2023		TLM2	CO1	
6	Blockchain and Distributed Trust	2	15-07-2023 17-07-2023		TLM2	CO1	
7	Currency and Cryptocurrency, How Cryptocurrency Works	2	18-07-2023 20-07-2023		TLM2	CO1	
8	Financial Services and Bitcoin Prediction Markets	2	21-07-2023 22-07-2023		TLM2	CO1	
9	Unit-I Assignment Test	1	24-07-2023		TLM2	CO1	
No. of classes required to complete UNIT-I		16	No. of classes taken:				

UNIT-II: Types of Blockchain

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	Hashing	2	25-07-2023 27-07-2023		TLM2	CO2		
11	Public key Cryptosystems	2	28-07-2023 31-07-2023		TLM2	CO2		
12	Private Vs Public Blockchain and Usecases	2	01-08-2023 03-08-2023		TLM2	CO2		
13	Hash Puzzles	2	04-08-2023 05-08-2023		TLM2	CO2		
14	Extensibility of Blockchain Concepts, Digital Identity Verification	2	07-08-2023 08-08-2023		TLM2	CO2		
15	Blockchain Neutrality, Digital Art	2	10-08-2023 11-08-2023		TLM2	CO2		
16	Unit-II Assignment Test	1	12-08-2023		TLM2	CO2		
No. of classes required to complete UNIT-2		13	No. of classes taken:					

UNIT – III: Introduction to Bitcoin

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	Bitcoin Blockchain	2	14-08-2023 17-08-2023		TLM2	CO3		
18	Scripts of Bitcoin Blockchain	2	18-08-2023 19-08-2023		TLM2	CO3		
19	Use cases of Bitcoin Blockchain scripting language	2	21-08-2023 22-08-2023		TLM2	CO3		
20	Micropayments and escrow	1	24-08-2023		TLM2	CO3		
21	Downside of Bitcoin Mining	2	26-08-2023 04-09-2023		TLM2	CO3		
22	Blockchain Science: Gridcoin	2	05-09-2023 08-09-2023		TLM2	CO3		
23	Folding Coin, Blockchain Genomics	2	09-09-2023 11-09-2023		TLM2	CO3		
24	Bitcoin MOOC's	1	12-09-2023		TLM2	CO3		
25	Unit-III Assignment Test	1	15-09-2023		TLM2	CO3		
No. of classes required to complete UNIT-3		15	No. of classes taken:					

UNIT-IV: Ethereum & HyperLedger

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	Introduction to Ethereum	2	16-09-2023 18-09-2023		TLM2	CO4		
27	IoTA	2	21-09-2023 22-09-2023		TLM2	CO4		
28	Need of Mining, Consensus	2	23-09-2023 25-09-2023		TLM2	CO4		
29	Byzantine Generals Problem	2	26-09-2023 29-09-2023		TLM2	CO4		
30	Consensus as a Distributed Coordination problem	2	30-09-2023 03-10-2023		TLM2	CO4		
31	Private or permissioned Blockchain	2	05-10-2023		TLM2	CO4		
32	Introduction to Hyper ledger, Currency,, Token, Campus coin	2	06-10-2023		TLM2	CO4		
33	Coin drop as strategy for public adoption, Currency Multiplicity	2	07-10-2023 09-10-2023		TLM2	CO4		
34	Unit-III Assignment Test	1	10-10-2023		TLM2	CO4		
No. of classes required to complete UNIT-4		17	No. of classes taken:					

UNIT-V: Applications of Blockchain

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	Challenges of Blockchain	2	12-10-2023 13-10-2023		TLM2	CO5	
36	Business Model Challenges	2	14-10-2023 16-10-2023		TLM2	CO5	
37	Scandals and Public Perception	2	17-10-2023 19-10-2023		TLM2	CO5	
38	Government Regulation	1	20-10-2023		TLM2	CO5	
39	Use of Blockchain in E-Governance	1	26-10-2023		TLM2	CO5	
40	Land Registration, Medical Information System.	1	27-10-2023		TLM2	CO5	
41	Revision	1	28-10-2023		TLM2	CO5	
No. of classes required to complete UNIT-5		10	No. of classes taken:				

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.	Interoperability and Cross-Chain Communication in Blockchain	1	25-08-2023		TLM2	
2.	Hybrid Consensus in Blockchain	1	14-09-2023		TLM2	

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

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

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	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.
PO 3	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.
PO 4	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.
PO 5	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.
PO 6	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.
PO 7	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
PO 8	Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	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.
PO 11	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
PO 12	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):

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. K. Phaneendra	Dr. M. Srinivasa Rao	Dr. K. Phaneendra	Dr. B. Srinivasa Rao
Signature				



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 CIVIL ENGINEERING

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-A A.Y : 2023-24

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

CO 1	Recognize the basic terminology of Environmental sanitation.
CO 2	Interpret the control approaches of Communicable and non-communicable diseases.
CO 3	Identify and assess the control approaches for rodent and vectors.
CO 4	Classify the appropriate sanitation measures for several institutions.
CO 5	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	-	1
CO2	2	1	1	-	-	1	1	-	-	-	-	1	1	-	1
CO3	2	1	1	-	-	1	1	-	-	-	-	1	1	-	1
CO4	2	1	2	-	-	1	1	-	-	-	-	1	1	1	1
CO 5	3	1	2	-	-	1	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, Frankln 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.

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	03-07-2023		TLM2	
2.	History sanitation practices	1	06-07-2023		TLM2	
3.	Evolution of sanitation practices	1	07-07-2023		TLM2	
4.	Role of Sanitary Engineer	1	07-07-2023		TLM2	
5.	Sanitation management aspects for liquid wastes	1	10-07-2023		TLM2	
6.	Sanitation management aspects for solid wastes	1	13-07-2023		TLM2	
7.	Revision	1	14-07-2023		TLM2	
8.	Tutorial	1	14-07-2023		TLM3	
9.	Basic Definitions	1	15-07-2023		TLM2	
10.	Basic Definitions	1	17-07-2023		TLM2	
11.	Types of diseases- Communicable diseases	1	20-07-2023		TLM2	
12.	Non-communicable diseases	1	21-07-2023		TLM2	
13.	Water borne diseases	1	21-07-2023		TLM2	
14.	Mortality rates	1	22-07-2023		TLM2	
15.	Revision	1	24-07-2023		TLM2	
16.	Tutorial	1	27-07-2023		TLM3	
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.	Communicable Diseases: Impacts,	1			TLM2	
2.	Control of Source (Agent Factors)	1	28-07-2023		TLM2	
3.	Control of Mode of Transmission Factor (Environmental Factors)	1	28-07-2023		TLM2	
4.	Control of Mode of Transmission Factor (Environmental Factors)	1	31-07-2023		TLM2	
5.	Control of Susceptibles (Host Factors)	1	03-08-2023		TLM2	
6.	Epidemic Control	1	04-08-2023		TLM2	
7.	Revision	1	04-08-2023		TLM2	
8.	Respiratory Diseases- Types, Impacts, Characteristics	1	05-08-2023		TLM2	
9.	Respiratory Diseases- Control	1	07-08-2023		TLM2	
10.	Water borne Diseases- Types,	1	10-08-2023		TLM2	

	Impacts, Characteristics				
11.	Water borne Diseases- Control	1	11-08-2023		TLM2
12.	Food borne Diseases- Types, Impacts, Characteristics	1	11-08-2023		TLM2
13.	Food borne Diseases- Control	1	14-08-2023		TLM2
14.	Revision	1	17-08-2023		TLM2
15.	Tutorial	1	18-08-2023		TLM3
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	18-08-2023		TLM2	
2.	Mosquito control	1	19-08-2023		TLM2	
3.	Larvae control	1	21-08-2023		TLM2	
4.	Adult control	1	24-08-2023		TLM2	
5.	Man-made mosquito breeding centres	1	25-08-2023		TLM2	
6.	Outdoor control of mosquitoes	1	25-08-2023		TLM2	
7.	Housefly as disease carrier	1	26-08-2023		TLM2	
8.	Fly control	1	04-09-2023		TLM2	
9.	Rodent control	1	07-09-2023		TLM2	
10.	Control Diseases transmitted from Animals.	1	08-09-2023		TLM2	
11.	Revision	1	08-09-2023		TLM2	
12.	Tutorial	1	11-09-2023		TLM3	
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/restaurants	1	14-09-2023		TLM2	
2.	Sanitation measures in public bathing ghats	1	15-09-2023		TLM2	
3.	Sanitation measures in Schools	1	15-09-2023		TLM2	
4.	Sanitation measures in Hospitals	1	16-09-2023		TLM2	
5.	Sanitation measures in Swimming pools	1	21-09-2023		TLM2	
6.	Sanitation measures in Prisons.	1	22-09-2023		TLM2	
7.	Revision	1	22-09-2023		TLM2	
8.	Tutorial	1	23-09-2023		TLM3	
No. of classes required to complete UNIT-IV:07				No. of classes taken:		

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.	Rural sanitation: Aqua privy, Septic tank, Soak pit and sulabh mode of sanitation	1	25-09-2023		TLM2	
2.	Rural sanitation: Appropriate low cost rural sanitation techniques	1	29-09-2023		TLM2	
3.	Rural sanitation: Biogas generation from toilet	1	29-09-2023		TLM2	
4.	Refuse Sanitation: Municipal garbage – sources, generation and collection	1	30-09-2023		TLM2	
5.	Refuse Sanitation: Municipal garbage – recovery and disposal options	1	05-10-2023		TLM2	
6.	Refuse Sanitation: Sanitation problems with regard to: Dumping and sanitary landfilling	1	06-10-2023		TLM2	
7.	Refuse Sanitation: Sanitation problems with regard to: Mass firing of waste and incineration	1	07-10-2023		TLM2	
8.	Refuse Sanitation: Mosquito breeding, Leachate, Management issues	1	09-10-2023		TLM2	
9.	Ecological Sanitation: Principle, Eco-sanitation as a sustainable approach	1	12-10-2023		TLM2	
10.	Occupational health hazards: Concept, Types, Safety aspects of sanitation workers	1	13-10-2023		TLM2	
11.	Revision	1	13-10-2023		TLM2	
12.	Tutorial	1	16-10-2023		TLM3	
13.	Revision	1	19-10-2023		TLM2	
14.	Revision	1	20-10-2023		TLM2	
15.	Revision	1	20-10-2023		TLM2	
16.	Revision	1	21-10-2023		TLM2	
17.	Revision	1	26-10-2023		TLM2	
18.	Revision	1	27-10-2023		TLM2	
19.	Revision	1	27-10-2023		TLM2	
20.	Revision	1	28-10-2023		TLM2	
No. of classes required to complete UNIT-V:10				No. of classes taken:		

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

PART-C

EVALUATION PROCESS (R20 Regulations):

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	Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	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.
PO 3	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.
PO 4	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.
PO 5	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.
PO 6	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.
PO 7	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.
PO 8	Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	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.
PO 11	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.
PO 12	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):

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

Course Instructor
(P MOHANAGANGA RAJU)

Course Coordinator
(P MOHANAGANGA RAJU)

Module Coordinator
(J RANGALAH)

HOD
(Dr.V. RAMAKRISHNA)



LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

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Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF INFORMATION TECHNOLOGY ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr.M.OLIVA, 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.: 2023-2024

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

CO1	Understand management principles to practical situations based on the organization structures. (L2)
CO2	Design Effective plant Layouts by using work study methods. (L2)
CO3	Apply quality control techniques for improvement of quality and materials management. (L3)
CO4	Develop best practices of HRM in corporate Business to raise employee productivity. (L2)
CO5	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
CO1	3	-	-	-	-	-	-	2	2	-	-	3	-	-	-
CO2	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-
CO3	-	3	-	-	-	-	-	-	-	-	-	3	-	-	-
CO4	-	-	-	-	-	-	-	3	2	-	-	3	-	-	-
CO5	-	-	-	-	-	-	-	-	-	-	2	3	-	-	-
	1 - Low				2 -Medium				3 - High						

PSO 1	To apply the principles of thermal sciences to design and develop various thermal systems.
PSO 2	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.
PSO 3	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 & weihrich – Essentials of management, TMH, 10th edition, 2015

R2 Stoner, Freeman, Gilbert, Management, 6th edition Pearson education, New Delhi, 2003

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	03-07-2023	03-07-2023	TLM1/TLM2	
2.	Management functions	1	04-07-2023	04-07-2023	TLM1/TLM2	
3.	Contributions of Taylor, Fayol	1	05-07-2023	05-07-2023	TLM1/TLM2	
4.	Contribution of Elton Mayo	1	06-07-2023	06-07-2023	TLM1/TLM2	
5.	Maslow's & Herzberg's Two Factor Theory	1	10-07-2023	10-07-2023	TLM1/TLM2	
6.	Douglas McGregor	1	11-07-2023	11-07-2023	TLM1/TLM2	
7.	Basic Concepts of Organization-Authority	1	12-07-2023	12-07-2023	TLM1/TLM2	
8.	Responsibility Delegation of Authority	1	12-07-2023	12-07-2023	TLM1/TLM2	
9.	Departmentation and Decentralization	1	13-07-2023	13-07-2023	TLM1/TLM2	
10.	Span of Control	1	15-07-2023	15-07-2023	TLM1/TLM2	
11.	Line, Line and Staff organizations	1	17-07-2023	17-07-2023	TLM1/TLM2	
12.	Functional, Committee	1	18-07-2023	18-07-2023	TLM1/TLM2	
13.	Matrix Organizations	1	19-07-2023	19-07-2023	TLM1/TLM2	
14.	Quiz-I	1	20-07-2023	20-07-2023	TLM1/TLM2	
No. of classes required to complete UNIT-I: 14				No. of classes taken:		

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	22-07-2023	22-07-2023	TLM1/TLM2	
16.	Factors influencing location	1	22-07-2023	22-07-2023	TLM1/TLM2	
17.	Principles	1	24-07-2023	24-07-2023	TLM1/TLM2	
18.	Types of plant layouts	1	26-07-2023	26-07-2023	TLM1/TLM2	
19.	Methods of production (job, batch production)	1	27-07-2023	27-07-2023	TLM1/TLM2	
20.	Mass production	1	28-07-2023	28-07-2023	TLM1/TLM2	
21.	Work study - Basic procedure involved in method study and Work measurement	1	31-07-2023	31-07-2023	TLM1/TLM2	
22.	Work study - Basic procedure involved in method study and Work measurement	1	01-08-2023	01-08-2023	TLM1/TLM2	

23.	Quiz-II	1	02-08-2023	02-08-2023	TLM1/TLM2	
No. of classes required to complete UNIT-II: 09				No. of classes taken:09		

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	03-08-2023	03-08-2023	TLM1/TLM2	
25.	Concept of Quality & Quality Control	1	05-08-2023	05-08-2023	TLM1/TLM2	
26.	Functions, Meaning of SQC	1	07-08-2023	07-08-2023	TLM1/TLM2	
27.	Variables and attributes	1	08-08-2023	08-08-2023	TLM1/TLM2	
28.	X chart	1	09-08-2023	09-08-2023	TLM1/TLM2	
29.	R Chart	1	10-08-2023	10-08-2023	TLM1/TLM2	
30.	C Chart	1	10-08-2023	10-08-2023	TLM1/TLM2	
31.	P Chart	1	14-08-2023	14-08-2023	TLM1/TLM2	
32.	Simple Problems	1	16-08-2023	16-08-2023	TLM1/TLM2	
33.	Acceptance sampling	1	16-08-2023	16-08-2023	TLM1/TLM2	
34.	Sampling plans	1	17-08-2023	17-08-2023	TLM1/TLM2	
35.	Deming's contribution to quality	1	19-08-2023	19-08-2023	TLM1/TLM2	
36.	Materials management	1	21-08-2023	21-08-2023	TLM1/TLM2	
37.	Meaning and objectives	1	22-08-2023	22-08-2023	TLM1/TLM2	
38.	Inventory control	1	23-08-2023	23-08-2023	TLM1/TLM2	
39.	Need for inventory control	1	24-08-2023	24-08-2023	TLM1/TLM2	
40.	Purchase procedure	1	26-08-2023	26-08-2023	TLM1/TLM2	
41.	Store records	1	28-08-2023	28-08-2023	TLM1/TLM2	
42.	EOQ, ABC analysis	1	29-08-2023	29-08-2023	TLM1/TLM2	
43.	Stock levels	1	30-08-2023	30-08-2023	TLM1/TLM2	
44.	Quiz-3	1	02-09-2023	02-09-2023	TLM1/TLM2	
No. of classes required to complete UNIT-III: 15				No. of classes taken:15		

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	04-09-2023	04-09-2023	TLM1/TLM2	
46.	Basic functions of HR manager	1	05-09-2023	05-09-2023	TLM1/TLM2	
47.	Man power planning	1	07-09-2023	07-09-2023	TLM1/TLM2	
48.	Recruitment	1	12-09-2023	12-09-2023	TLM1/TLM2	
49.	Selection	1	13-09-2023	13-09-2023	TLM1/TLM2	

50.	Training and development	1	14-09-2023	14-09-2023	TLM1/TLM2	
51.	Placement	1	16-09-2023	16-09-2023	TLM1/TLM2	
52.	Wage and salary administration	1	19-09-2023	19-09-2023	TLM1/TLM2	
53.	Wage and salary administration	1	20-09-2023	20-09-2023	TLM1/TLM2	
54.	Promotion	1	23-09-2023	23-09-2023	TLM1/TLM2	
55.	Transfers Separation	1	27-09-2023	27-09-2023	TLM1/TLM2	
56.	Performance appraisal	1	29-09-2023	29-09-2023	TLM1/TLM2	
57.	Job evaluation and merit rating	1	04-10-2023	04-10-2023	TLM1/TLM2	
58.	Quiz-4	1	05-10-2023	05-10-2023	TLM1/TLM2	
No. of classes required to complete UNIT-IV: 14				No. of classes taken:		

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	05-10-2023	05-10-2023	TLM1/TLM2	
60.	Early techniques in project management	1	06-10-2023	06-10-2023	TLM1/TLM2	
61.	Network analysis	1	07-10-2023	07-10-2023	TLM1/TLM2	
62.	Programme Evaluation and Review Technique (PERT)	1	09-10-2023	09-10-2023	TLM1/TLM2	
63.	Problems	1	11-10-2023	11-10-2023	TLM1/TLM2	
64.	Critical path method (CPM)	1	12-10-2023	12-10-2023	TLM1/TLM2	
65.	Identifying critical path	1	13-10-2023	13-10-2023	TLM1/TLM2	
66.	Problems	1	16-10-2023	16-10-2023	TLM1/TLM2	
67.	Problems	1	18-10-2023	18-10-2023	TLM1/TLM2	
68.	Probability of completing project within given time	1	18-10-2023	18-10-2023	TLM1/TLM2	
69.	Project cost analysis	1	19-10-2023	19-10-2023	TLM1/TLM2	
70.	Problems	1	20-10-2023	20-10-2023	TLM1/TLM2	
71.	project crashing	1	25-10-2023	25-10-2023	TLM1/TLM2	
72.	Simple problems	1	26-10-2023	26-10-2023	TLM1/TLM2	
73.	Simple problems	1	27-10-2023	27-10-2023	TLM1/TLM2	
No. of classes required to complete UNIT-V: 14				No. of classes taken:		

Teaching Learning Methods			
TLM1	Chalk and Talk	TLM4	Demonstration (Lab/Field Visit)
TLM2	PPT	TLM5	ICT (NPTEL/Swayam Prabha/MOOCs)
TLM3	Tutorial	TLM6	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):

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

PROGRAMME OUTCOMES (POs):

PO 1	Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	Problem analysis: Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	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.
PO 4	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.
PO 5	Modern tool usage: 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.
PO 6	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.
PO 7	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.
PO 8	Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO 10	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.
PO 11	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.
PO 12	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):

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Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Mr.M.OLIVA	Mr. A.Nageswara Rao	Dr.M.B.S.Sreekara Reddy	Dr.S.PICHHI Reddy
Signature				

