LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)

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

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

hodcse@lbrce.ac.in, cseoffice@lbrce.ac.in, Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF COMPUTER SCIENCE &ENGINEERING(AI&ML)

COURSE HANDOUT

PART-A

Name of Course Instructor   : Mrs.D MANGAMMA.

Course Name & Code   **:** INFORMATION SECURITY (20CS17)

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

Program/Sem/Sec   **:** B.Tech/CSE(AI&ML)/VII-Sem/A Section   A. Y   : 2025 - 26

PRE-REQUISITE   **:** Computer Networks, Number theory and programming language

COURSE EDUCATIONAL OBJECTIVES (CEOs):

The Objective of the course is to course elevate the security aspects and provides the knowledge to understand the basic concept of Cryptography and Network Security principles. It antilight 's different types of cipher mechanisms and various symmetric and asymmetric algorithms. Also provides the knowledge on digital signatures, different threats, viruses, intruders, and firewalls.

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

CO1	Summarize encryption algorithms to achieve data confidentiality. **(Understand-L2)**
CO2	Apply Secure hash functions for attaining data integrity. **(Apply-L3)**
CO3	Illustrate email security mechanisms to achieve authentication. **(Understand- L2)**
CO4	Demonstrate the techniques of web security. **(Understand-L2)**
CO5	Examine the threats and remedial measures for system security. **(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	2	-	-	1	-	-	-	-	-	1	1	-	-
CO2	2	3	2	-	-	1	-	-	-	-	-	1	1	-	-
CO3	2	3	2	-	-	2	-	-	-	-	-	1	1	-	-
CO4	2	1	2	-	-	2	-	-	-	-	-	1	1	-	-
CO5	2	2	1	-	-	1	-	-	-	-	-	1	1	-	-

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

    1- Low   **2 –**Medium   **3** High

TEXTBOOKS:

T1   William Stallings, "Network Security Essentials (Applications and Standards)", Pearson
T2   Education, 1999.
William Stallings, "Cryptography and Network Security", PHI/Pearson, fourth edition,

2000.

REFERENCE BOOKS:

R1   Whitman, "Principles of Information Security", Thomson, PHI, 2000.
R2   Robert Bragg, Mark Rhodes, Network Security: The complete reference, TMH
R3   Buchmann, Introduction to Cryptography, Springer,2010.
R4   Jeetendra pande, Ajay, "Digital Foresnsics', ISBN: 978-93-84813-94-9.

PART-B

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	HOD Sign Weekly
1.	Introduction of IS	1	30.06.2025		TLM1	
2.	Introduction of IS	1	02.07.2025		TLM1	
3.	Security Attacks	1	03.07.2025		TLM1	
4.	Security Services Mechanisms	1	04.07.2025		TLM1	
5.	Integrity, Authentication Confidentiality & &Non-Repudiation	1	05.07.2025		TLM1	
6.	Substitution Techniques	1	07.07.2025		TLM1	
7.	Transposition Techniques	1	09.07.2025		TLM1	
8.	Block Cipher, Block Cipher	1	10.07.2025		TLM1	
9.	Fiestal Structure	1	11.07.2025		TLM1	
10.	DES, Triple DES Algorithm	1	12.07.2025		TLM1	
11.	DES Algorithm	1	14.07.2025		TLM1	
12.	AES Algorithm	1	16.07.2025		TLM1	
13.	Cipher Block Modes of Operations	1	17.07.2025		TLM1	
14.	Placement of encryption	1	18.07.2025		TLM1	
15.	Traffic Analysis	1	19.07.2025		TLM1	
16.	Key Distribution	1	21.07.2025		TLM1	
17.	Revision	1	23.07.2025		TLM1	
18.	Revision	1	24.07.2025		TLM1	
19.	tutoial	2	25.07.2025 & 28.07.2025		TLM3	
No. of classes required to complete UNIT-I		20				

UNIT-II: PUBLIC -KEY CRYPTOGRAPHY

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
20	INTRODUCTION	1	30.07.2025		TLM1	
21	Approaches of Message Authentication,	1	31.07.2025		TLM1	
22	Hash & MAC functions	2	01.08.2025 & 02.08.2025		TLM1	
23	HMAC Algorithm	1	04.08.2025		TLM1	
24	Public-Key Encryption Algorithm- RSA	1	06.08.2025		TLM1	
25	Diffie –Hellman Key Exchange Algorithm	1	07.08.2025		TLM1	
26	tutorial	1	08.08.2025		TLM3	
27	SHA-512	1	09.08.2025		TLM1	
28	Digital Signatures	1	11.08.2025		TLM1	
29	Public Key Infrastructure, Digital Certificates	1	13.08.2025		TLM1	
30	Certificate Authority, Key Management	1	14.08.2025		TLM1	
31	Kerberos, X.509 Directory Authentication Service	2	18.08.2025 & 20.08.2025		TLM1	
32	Revision	1	21.08.2025		TLM1	
33	tutorial	2	& 23.08.2025		TLM3	
No. of classes required to complete UNIT-II		17		No. of classes taken:		

UNIT-III: EMAIL PRIVACY

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
34	Introduction, Email privacy, Pretty GoodPrivacy (PGP)	1	21-08-2025		TLM1	
35	PGP Key Management	1	22.08.2025		TLM1	
36	MIME and S/ MIME, IP Security Overview, IP Security Architecture,	1	23.08.2025		TLM1	
37	Authentication Header	1	15.09.2025		TLM1	

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
	Encapsulating Security Payload,					
38	Tunnel and Transport Modes	1	17.09.2025		TLM1	
39	Combining Security Associations, Key Exchange	1	18.09.2025		TLM1	
40	Cryptographic Suites	1	19.09.2025		TLM1	
41	Unit Overview and Discussion	1	25.09.2025		TLM1	
42	Revision	2	20.09.2025 & 22.09.2025		TLM1	
43	Tutorial	1	24.09.2025		TLM3	
MID - I (08.09.2025 TO 13.09.2025)						
No. of classes required to complete UNIT-III		11		No. of classes taken:		

UNIT-IV: WEB SECURITY

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
44	Introduction	1	26.09.2025		TLM1	
45	Web Security Requirements	1	27.09.2025		TLM1	
46	Secure Socket Layer (SSL)Architecture	1	29.09.2025 & 01.10.2025		TLM1	
47	Secure Socket Layer (SSL)Architecture	1	03.10.2025 & 04.10.2025		TLM1	
48	SSL Handshake Protocol	1	06.10.2025		TLM1	
49	Tutorial	2	08.10.2025 & 09.10.2025			
50	Transport Layer Security	2	10.10.2025 & 11.10.2025		TLM1	
51	Secure Electronic Transaction (SET)	2	13.10.2025 & 15.10.2025		TLM1	
52	Payment Processing	1	16.10.2025		TLM1	
53	HTTPs. HTTP vs HTTPs	1	17.10.2025		TLM1	

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
54	HTTPs. HTTP vs HTTPs	1	18.10.2025		TLM1	
55	Unit Overview and Discussion	1	20.10.2025		TLM1	
56	Revision	1	22.10.2025		TLM1	
57	Revision	1	23.10.2025		TLM1	
58	Tutorial	2	24.10.2025 & 25.10.2025		TLM3	
No. of classes required to complete UNIT-IV		19		No. of classes taken:		

UNIT-V: INTRUDERS

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	27.10.2025		TLM2	
60	Intruder Behaviour Patterns	1	29.10.2025		TLM2	
61	Intrusion Techniques	1	30.10.2025		TLM2	
62	Honeypot	1	31.10.2025		TLM2	
63	Malicious Software	1	01.11.2025		TLM2	
64	Viruses	1	03.11.2025		TLM2	
65	Related Threats	1	05.11.2025		TLM2	
66	DDOoS	1	06.11.2025		TLM2	
67	Firewall Design principles	1	07.11.2025		TLM2	
68	Trust Management System	1	08.11.2025		TLM2	
69	Introduction to Digital forensics	1	10.11.2025		TLM2	
70	Unit 1,2,3,4&5 Overview and Discussion	1	12.11.2025		TLM1	
71	Unit 1,2,3,4&5 Overview and Discussion	1	13.11.2025		TLM1	
72	Tutorial	2	14.11.2025 & 15.11.2025		TLM3	
No. of classes required to complete UNIT-V		15		No. of classes taken:		
MID - II (17.11.2025 TO 22.11.2025)						

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– 1 (Units I,II&III(Half of the Syllabus))	A1=5
I-Descriptive Examination (Units I, II&III (Half of the Syllabus))	M1=15
I-Quiz Examination (Units I, II&III (Half of the Syllabus))	Q1=10
Assignment– 2 (Units III (remaining Half of the Syllabus),IV&V))	A2=5
II- Descriptive Examination (Units III (remaining Half of the Syllabus), IV&V))	M2=15
II-Quiz Examination (Units III (remaining Half of the Syllabus), IV&V))	Q2=10
Mid Marks=80% of Max((M1+A1+Q1),(M2+A2+Q2))+ 20% of Min((M1+A1+Q1),(M2+A2+Q2))	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 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, demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethics**: Apply ethical principles and commit to professional ethics, responsibilities, and norms of the engineering practice.
PO 9	**Individual and teamwork**: 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, such as, being able to comprehend andwrite 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	Mrs. D MANGAMMA	Mrs. D MANGAMMA	Mr. R CHIRANJEEVI	Dr. S.JAYAPRADA
Signature				

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Accredited by NAAC with 'A' Grade
An ISO 21001:2018,14001:2015,50001:2018 Certified Institution
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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING (AI&ML)
COURSE HANDOUT
PART-A

Name of Course Instructor: Dr. Shaik Salma Asiya Begum (T956)

Course Name & Code : NATURAL LANGUAGE PROCESSING, 20AD09

L-T-P Structure **: 3-0-0** **Credits:** 03

Program/Sem/Sec : B.Tech-CSE(AI&ML)/ VII SEM/A

A.Y. **:** 2025-26

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**
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	30-6-2025		TLM1	CO1	
2	Knowledge in Speech and Language Processing	2	01-07-2025 02-07-2025		TLM1	CO1	
3	Ambiguity; Models and Algorithms	2	03-07-2025 05-07-2025		TLM1	CO1	
4	Language, Thought and Understanding;	2	07-07-2025 08-07-2025		TLM1	CO1	
5	History Regular Expressions Regular Expression	2	09-07-2025 10-07-2025		TLM1	CO1	
6	Words; Corpora;	2	14-07-2025 15-07-2025		TLM1	CO1	
7	Text Normalization	2	16-07-2025 17-07-2025		TLM1	CO1	
8	Minimum Edit Distance	2	19-07-2025 21-07-2025		TLM1	CO1	
9	Unit-I Assignment Test	1	22-07-2025		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	23-07-2025 24-07-2025		TLM1	CO2	
11	Generalization and Zeros.	2	26-07-2025 28-07-2025		TLM1	CO2	
12	Smoothing: Laplace Smoothing	2	29-07-2025 30-07-2025		TLM1	CO2	
13	Add-k Smoothing	2	31-07-2025 02-08-2025		TLM1	CO2	
14	Backoff and Interpolation	2	04-08-2025 05-08-2025		TLM1	CO2	
15	Kneser-Ney Smoothing	2	06-08-2025 07-08-2025		TLM1	CO2	
16	Unit-II Assignment Test	1	11-08-2025		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	12-08-2025 13-08-2025		**TLM1**	CO3	
18	Tokenizing; Filtering Stop words; Stemming	2	14-08-2025 18-08-2025		**TLM1**	CO3	
19	Tagging parts of speech; Lemmatizing;	2	19-08-2025 20-08-2025		**TLM1**	CO3	
20	Chunking	2	21-08-2025 23-08-2025		**TLM1**	CO3	
21	Chinking Part-II: Using Named Entity Recognition (NER)	2	15-09-2025 16-09-2025		**TLM1**	CO3	
22	Getting Text to Analyze	2	17-09-2025 18-09-2025		**TLM1**	CO3	
23	Using a Concordance	2	20-09-2025 22-09-2025		**TLM1**	CO3	
24	Making a Dispersion Plot.	2	23-09-2025 24-09-2025		**TLM1**	CO3	
25	Unit-III Assignment Test	1	25-09-2025		**TLM1**	CO3	
No. of classes required to complete UNIT-3		**17**					
			No. of classes taken:				
I MID EXAMINATIONS (08-09-2025 TO 13-09-2025)							

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	27-09-2025 01-10-2025		**TLM1**	CO4	
27	Using Patterns to extract relations	2	04-10-2025 06-10-2025		**TLM1**	CO4	
28	Relation extraction via supervised learning	2	07-10-2025 08-10-2025		**TLM1**	CO4	
29	Semi supervised relation extraction via bootstrapping	2	09-10-2025 11-10-2025		**TLM1**	CO4	
30	Distant Supervision for Relation Extraction	2	13-10-2025 14-10-2025		**TLM1**	CO4	
31	Evaluation of Relation Extraction	2	15-10-2025 16-10-2025		**TLM1**	CO4	
32	Extracting Times	2	18-10-2025 20-10-2025		**TLM1**	CO4	
33	Extracting Events and their Times; Template Filling	2	22-10-2025 23-10-2025		**TLM1**	CO4	
34	Unit-IV Assignment Test	1	25-10-2025		**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	27-10-2025 28-10-2025		**TLM1**	CO5	
36	Relations between senses	2	29-10-2025 30-10-2025		**TLM1**	CO5	
37	WordNet: Sense relations in WordNet	2	01-11-2025 03-11-2025		**TLM1**	CO5	
38	Word Sense Disambiguation	1	04-11-2025		**TLM1**	CO5	
39	Alternate WSD algorithms and Tasks	1	05-11-2025		**TLM1**	CO5	
40	Alternate WSD algorithms and Tasks	1	06-11-2025		**TLM1**	CO5	
41	Unit-V Assignment Test	1	10-11-2025		**TLM1**	CO5	
No. of classes required to complete UNIT-5		10	No. of classes taken:				
II MID EXAMINATIONS (17-11-2025 TO 22-11-2025)							

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 teamwork**: 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.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Dr Shaik Salma Asiya Begum	Mrs B Swathi	Mrs B Swathi	Dr S JayaPrada
Signature				

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
(AUTONOMOUS)
Accredited by NAAC with 'A' Grade & NBA (Under Tier - I),
An ISO 21001:2018,14001:2015,50001:2018 Certified Institution
Approved by AICTE, New Delhi and Affiliated to JNTUK, Kakinada
L.B. REDDY NAGAR, MYLAVARAM, NTR DIST., A.P.-521 230.
hodcsm@lbrce.ac.in, csmoffice@lbrce.ac.in, Phone: 08659-222 933, Fax: 08659-222931

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING(AI&ML)

COURSE HANDOUT
PART-A

Name of Course Instructor   : Mr. Ch. John Wesily
Course Name & Code   : BLOCK CHAIN TECHNOLOGIES (20CS29)
L-T-P Structure   : 3-0-0   Credits : 3
Program/Sem/Sec   : B.Tech., CSE(AI&ML), VII-A   A.Y: 2024-25

PRE-REQUISITE: Information Security

COURSE EDUCATIONAL OBJECTIVES (CEOs):

To understand block chain technology and Crypto currency works.

COURSE OUTCOMES (COs): After the completion of the course, student will be able to

CO 1	Demonstrate the block chain basics, Crypto currency. (UnderstandL2)
CO 2	Compare and contrast the use of different private vs. public block chain and use cases (Understand-L2)
CO 3	Design an innovative Bit coin Block chain and scripts, Block chain Science on varies coins (Apply-L3)
CO 4	Classify Permission Block chain and use cases Hyper ledger, Corda(Analyze-L4)
CO 5	Use of Block-chain in E-Governance, Land Registration, Medical Information Systems and others (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	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:

    T1: Block chain Blue print for Economy by Melanie Swan

REFERENCE BOOKS:

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

PART-B

COURSE DELIVERY PLAN (LESSON PLAN): Section A

UNIT-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
1.	Introduction	2	30-06-2025		TLM1	
2.	basic ideas behind block chain	1	01-07-2025		TLM1	
3.	how it is changing the landscape of digitalization	1	03-07-2025		TLM1	
4.	introduction to cryptographic concepts required	1	04-07-2025		TLM1	
5.	Block chain or distributed trust	2	07-07-2025		TLM1	
6.	Currency	1	08-07-2025		TLM1	
7.	Cryptocurrency	1	10-07-2025		TLM1	
8.	How a Cryptocurrency works	1	11-07-2025		TLM1	
9.	Financial services	1	14-07-2025		TLM1	
10.	Bitcoin prediction markets.	1	14-07-2025		TLM1	
11.	Tutorial-I	1	15-07-2025		TLM1	
No. of classes required to complete UNIT-I		**14**		**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
12.	Hashing	1	18-07-2025		TLM1	
13.	public key cryptosystems	2	21-07-2025		TLM1	
14.	private vs public block chain and use cases	1	22-07-2025		TLM1	
15.	Hash Puzzles,	1	24-07-2025		TLM1	
16.	Extensibility of Block chain concepts	2	25-07-2025		TLM1	
17.	Digital Identity verification	1	28-07-2025		TLM1	
18.	Block chain Neutrality	2	28-07-2025		TLM1	
19.	Digital art	1	29-07-2025		TLM1	
20.	Block chain	2	31-07-2025		TLM1	

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
	Environment					
21.	Tutorial-II	1	04-08-2025		TLM1	
No. of classes required to complete UNIT-II		**14**		**No of classes taken**		

UNIT-III:

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
22.	Bitcoin Block chain and scripts	2	05-08-2025 & 07-08-2025		TLM1	
23.	Use cases of Bitcoin Blockchain scripting language in micropayment	2	08-08-2025 & 11-08-2025		TLM1	
24.	escrow etc Downside of Bit coin mining	2	12-08-2025 & 14-08-2025		TLM1	
25.	Block chain Science: Grid coin	2	15-08-2025 & 18-08-2025		TLM1	
26.	Folding coin	1	19-09-2025		TLM1	
27.	Block chain Genomics	1	22-09-2025		TLM1	
28.	Bit coin MOOCs	1	22-09-2025		TLM1	
29.	Tutorial-III	1	23-09-2025		TLM3	
No. of classes required to complete UNIT-III		**12**		**No of classes taken**		

UNIT-IV:

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
30.	Ethereum continued	2	25-09-2025 & 26-09-2025		TLM1	
31.	IOTA	1	29-09-2025		TLM1	
32.	The real need for mining	1	29-09-2025		TLM2	
33.	consensus	1	30-09-2025		TLM1	
34.	Byzantine Generals Problem	1	02-10-2025		TLM2	
35.	Consensus as a distributed coordination problem	2	03-10-2025		TLM1	

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.	Coming to private or permissioned block chains	2	06-10-2025		TLM2	
37.	Introduction to Hyper ledger	1	07-10-2025		TLM1	
38.	Currency & Token	1	09-10-2025		TLM1	
39.	Campus coin	1	10-10-2025		TLM2	
40.	Coin drop as a strategy for Public adoption	1	13-10-2025		TLM1	
41.	Currency Multiplicity	1	13-10-2025		TLM2	
42.	Demurrage currency	1	14-10-2025		TLM1	
43.	Tutorial-IV	1	16-10-2025		**TLM3**	
No. of classes required to complete UNIT-IV		**17**		**No of classes taken**		

UNIT-V:

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
44.	Technical challenges	2	17-10-2025 & 20-10-2025		TLM1	
45.	Business model challenges	2	21-10-2025		TLM2	
46.	Scandals and Public perception	2	23-10-2025		TLM1	
47.	Government Regulations	2	02.11.2024		TLM2	
48.	Uses of Block chain in E-Governance	1	05.11.2024		TLM1	
49.	Land Registration	1	06.11.2024		TLM1	
50.	Medical Information Systems.	1	08.11.2024		TLM2	
51.	Tutorial – V / Quiz - V	1	27-10-2025		TLM3	
52.	Discussion about SEE paper	1	30-10-2025		TLM3	
No. of classes required to complete UNIT-V		**13**		**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 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	**Ethic**s: 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. John Wesily**	**Dr. K. Phaneendra**		**Dr. S. Jayaprada**
Signature				

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING
COURSE HANDOUT
PART-A

Name of Course Instructor   :   Mrs G.Tabitar
Course Name & Code   : Utilization of Electrical Energy & 20EE83
L-T-P Structure   : 3-0-0   Credits : 3
Program/Sem/Sec   : B.Tech, AI & ML,Sec- A,VII-Sem.   A.Y   : 2025-26

Pre-requisites   : --NIL

Course Educational Objective: This course enables the student to familiarize with characteristics of various drives, comprehend the different issues related to heating, welding and illumination.

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

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

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,3rd Edition,2015.

T2: N.V.Suryanarayana "Utilization of electric power including electric drives and electric traction, New age international publishers New Delhi,2nd 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, CEO's &CO's	1	30-06-2025		TLM1	
2.	Advantages &applications of Electric heating	1	02-07-2025		TLM2	
3.	Classification of electric heating	1	03-07-2025		TLM2	
4.	Resistance heating	1	05-07-2025		TLM2	
5.	Arc heating	1	07-07-2025		TLM2	
6.	Induction heating	1	09-07-2025		TLM2	
7.	dielectric heating	1	10-07-2025		TLM2	
8.	Causes of failures of heating elemdents	1	12-07-2025		TLM2, TLM6	
9.	Materials for heating elements	1	14-07-2025		TLM2, TLM6	
10.	Requirement of good heating material	1	16-07-2025		TLM2	
11.	ARC Furnace	1	17-07-2025		TLM2, TLM4	
12.	Resistance welding	1	19-07-2025		TLM2	
13.	Spot welding,seam welding	1	21-07-2025		TLM2, TLM4	
14.	,Arc welding	1	23-07-2025		TLM2, TLM4	
15.	Comparision between AC and DC welding	1	24-07-2025		TLM2, TLM6	
No. of classes required to complete UNIT-I : 15				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
16	Introduction	1	26-07-2025		TLM1	
17	Nature of light	1	28-07-2025		TLM2	
18	Laws of illumination	1	30-07-2025		TLM1	
19	Laws of illumination	1	31-07-2025		TLM1	
20	Lighting schemes, sources of light	1	02-08-2025		TLM2	
21	Fluorescent Lamp, CFL and LED	1	04-08-2025		TLM1, TLM4	
22	Sodium Vapor Lamp	1	06-08-2025		TLM1, TLM4	
23	Neon lamps	1	07-08-2025		TLM1, TLM2	
24	mercury vapor	1	11-08-2025		TLM1,	

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
	lamps				TLM2	
25	Comparision between tungsten &fluroscent tubes	1	13-08-2025		TLM1, TLM2	
26	Requirements of good lighting	1	14-08-2025		TLM2, TLM6	
27	Street lighting	1	18-08-2025		TLM2	
28	Assignment/Quiz	1	20-08-2025		TLM1	

No. of classes required to complete UNIT-II : 13   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
29	Introduction	1	21-08-2025		TLM2	
30	Elements of drive, advantages	1	23-08-2025		TLM2	
31	Factors affecting selection of motor	1	15-09-2025		TLM2	
32	Types of loads	1	17-09-2025		TLM2	
33	Industrial applications	1	18-09-2025		TLM1, TLM2	
34	Transient Characteristics of drives	1	20-09-2025		TLM1, TLM2	
35	Steady state characteristics of drives	1	22-09-2025		TLM1, TLM2	
36	Size of motor, Load Equalization	1	24-09-2025		TLM1, TLM2	
37	Assignment/Quiz	1	25-09-2025		TLM2	

No. of classes required to complete UNIT-III : 09   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
39	Introduction	1	27-09-2025		TLM2	
40	Requirement of an ideal traction system	1	29-09-2025		TLM2	
41	Supply system for electric traction	1	04-10-2025		TLM2	
42	Train movement	1	06-10-2025		TLM2	
43	mechanism of train movement	1	08-10-2025		TLM2	
44	Traction motors	1	09-10-2025		TLM1, TLM2	
45	Modern trends in electric traction	1	11-10-2025		TLM2, TLM6	
46	Automation in traction	1	13-10-2025		TLM1, TLM2	
47	Speed time curves for different services	1	15-10-2025		TLM1, TLM2	
48	Trapezoidal speed time curves	1	16-10-2025		TLM1, TLM2	

49	Quadrilateral speed time curves	1	18-10-2025		TLM1	
50	Problems on train movement	1	22-10-2025		TLM1	
51	Assignment/quiz	1	23-10-2025		TLM2	
No. of classes required to complete UNIT-IV : 13					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
52	Desirable characteristics	1	25-10-2025		TLM2	
53	Types of Tariff, Flat rate, Block-rate	1	27-10-2025		TLM2	
54	Numericals on types of Tariff	1	29-10-2025		TLM3	
55	KVA maximum demand	1	30-10-2025		TLM1, TLM2	
56	Time of Day tariff	1	01-11-2025		TLM1, TLM2	
57	Disadvantages of low power factor, Advantages of improved p.f	1	03-11-2025		TLM1, TLM2	
58	Improvement devices , Power factor improvement using static capacitor	1	05-11-2025		TLM1, TLM2	
59	Most economical power factor	1	06-11-2025		TLM2	
60	Location of power factor improvement devices from consumer	1	10-11-2025		TLM1, TLM2	
61	Assignment/quiz	1	12-11-2025		TLM2	
62	REVISION	1	13-11-2025		TLM1, TLM2	
63	REVISION	1	15-11-2025		TLM1, TLM2	
No. of classes required to complete UNIT-V : 12					No. of classes taken:	

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 Weekly
64	Economic aspects in utilization of electrical energy	2	13-11-2025 & 15-11-2025		TLM2, TLM6	

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

ACADEMIC CALENDAR:

Description	From	To	Weeks
I Phase of Instructions	30-06-2025	23-08-2025	8 W
Technical Training	25-08-2025	06-09-2025	2 W
I Mid Examinations	08-09-2025	13-09-2025	1 W
II Phase of Instructions	15-09-2025	15-11-2025	9 W
II Mid Examinations	17-11-2025	22-11-2025	1 W
Preparation and Practicals	24-11-2025	29-11-2025	1 W
Semester End Examinations	01-12-2025	13-12-2025	2 W

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 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):

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.

Mrs.G.Tabita	Dr.AV.G.A.Martanda	Dr.M.S.Giridhar	Dr. P. Sobha Rani
Course Instructor	Course Coordinator	Module Coordinator	HOD/EEE

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)
Accredited by NAAC, NBA(TIER-I) & ISO 9001:2015 Certified Institution
Approved by AICTE, New Delhi. and Affiliated to JNTUK, Kakinada
L.B. REDDY NAGAR, MYLAVARAM, NTR DIST., A.P.-521 230.
Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF CIVIL ENGINEERING

COURSE HANDOUT
PART-A

Name of Course Instructor   : EESHWAR RAM J
Course Name & Code   : ENVIRONMENTAL SANITATION & 20CE84
L-T-P Structure   : 3-0-0   Credits : 3
Program/Sem/Sec   : B.Tech., VII-Sem., CSE AI &ML   A.Y   : 2025-26

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
CO2	2	-	-	-	-	1	1	-	-	-	-	1	1	-	1
CO3	2	-	-	-	-	1	1	-	-	-	-	1	1	-	1
CO4	2	-	-	-	-	1	1	-	-	-	-	1	1	-	1
CO5	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.

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.	CO's and PO's	1	30-06-2025		**TLM2**	
2.	Introduction of sanitation practices	1	02-07-2025		**TLM2**	
3.	History sanitation practices	1	03-07-2025		**TLM2**	
4.	Evolution of sanitation practices	1	05-07-2025		**TLM2**	
5.	Role of Sanitary Engineer	1	07-07-2025		**TLM2**	
6.	Sanitation management aspects for liquid wastes	1	09-07-2025		**TLM2**	
7.	Sanitation management aspects for solid wastes	1	10-07-2025		**TLM2**	
8.	Basic Definitions	1	14-07-2025		**TLM2**	
9.	Types of diseases- Communicable diseases	1	16-07-2025		**TLM2**	
10.	Non-communicable diseases	1	17-07-2025		**TLM2**	
11.	Water borne diseases	1	19-07-2025		**TLM2**	
12.	Mortality rates	1	21-07-2025		**TLM2**	
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	23-07-2025		**TLM2**	
2.	Control of Source (Agent Factors)	1	24-07-2025		**TLM2**	
3.	Control of Mode of Transmission Factor (Environmental Factors)	1	26-07-2025		**TLM2**	
4.	Control of Mode of Transmission Factor (Environmental Factors)	1	28-07-2025		**TLM2**	
5.	Control of Susceptibles (Host Factors)	1	30-07-2025		**TLM2**	
6.	Epidemic Control	1	31-07-2025		**TLM2**	
7.	Respiratory Diseases- Types, Impacts, Characteristics	1	02-08-2025		**TLM2**	
8.	Respiratory Diseases- Control	1	04-08-2025		**TLM2**	
9.	Water borne Diseases- Types, Impacts, Characteristics	1	06-08-2025		**TLM2**	
10.	Water borne Diseases- Control	1	07-08-2025		**TLM2**	
11.	Food borne Diseases- Types, Impacts, Characteristics	1	11-08-2025		**TLM2**	

12.	Food borne Diseases- Control	1	13-08-2025		**TLM2**	
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	14-08-2025		**TLM2**	
2.	Mosquito control	1	18-08-2025		**TLM2**	
3.	Larvae control	1	20-08-2025		**TLM2**	
4.	Adult control	1	21-08-2025		**TLM2**	
5.	Man-made mosquito breeding centres	1	23-08-2025		**TLM2**	
6.	Outdoor control of mosquitoes	1	15-09-2025		**TLM2**	
7.	Housefly as disease carrier	1	17-09-2025		**TLM2**	
8.	Fly control	1	18-09-2025		**TLM2**	
9.	Rodent control	1	20-09-2025		**TLM2**	
10.	Control Diseases transmitted from Animals.	1	22-09-2025		**TLM2**	
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	24-09-2025		**TLM2**	
2.	Sanitation measures in Restaurants	1	25-09-2025		**TLM2**	
3.	Sanitation measures in public bathing ghats	1	27-09-2025		**TLM2**	
4.	Sanitation measures in Schools	1	29-09-2025		**TLM2**	
5.	Sanitation measures in Schools	1	04-10-2025		**TLM2**	
6.	Sanitation measures in Hospitals	1	06-10-2025		**TLM2**	
7.	Sanitation measures in Hospitals	1	08-10-2025		**TLM2**	
8.	Sanitation measures in Swimming pools	1	09-10-2025		**TLM2**	
9.	Sanitation measures in Swimming pools	1	13-10-2025		**TLM2**	
10.	Sanitation measures in Prisons.	1	15-10-2025		**TLM2**	
11.	Revision	1	16-10-2025		**TLM2**	
12.	Revision	1	18-10-2025		**TLM2**	
No. of classes required to complete UNIT-IV:10				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	22-10-2025		**TLM2**	
2.	**Rural sanitation**: Appropriate low-cost rural sanitation techniques	1	23-10-2025		**TLM2**	
3.	**Rural sanitation**: Biogas generation from toilet	1	25-10-2025		**TLM2**	
4.	**Refuse Sanitation:** Municipal garbage – sources, generation and collection	1	27-10-2025		**TLM2**	
5.	**Refuse Sanitation:** Municipal garbage – recovery and disposal options	1	29-10-2025		**TLM2**	
6.	**Refuse Sanitation:** Sanitation problems with regard to: Dumping and sanitary landfilling	1	30-10-2025		**TLM2**	
7.	**Refuse Sanitation:** Sanitation problems with regard to: Mass firing of waste and incineration	1	01-11-2025		**TLM2**	
8.	**Refuse Sanitation:** Mosquito breeding, Leachate, Management issues	1	03-11-2025		**TLM2**	
9.	**Ecological Sanitation:** Principle, Eco-sanitation as a sustainable approach	1	05-11-2025		**TLM2**	
10.	**Occupational health hazards:** Concept, Types, Safety aspects of sanitation workers	1	06-11-2025		**TLM2**	
11.	**Revision**	1	10-11-2025		**TLM2**	
12.	**Revision**	1	12-11-2025		**TLM2**	
13.	**Revision**	1	13-11-2025		**TLM2**	
14.	**Revision**	1	15-11-2025		**TLM2**	
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

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
Cumulative Internal Examination: A+ +M+Q	**30**
Semester End Examinations	**70**
Total Marks	**100**

PROGRAM OUTCOMES:

1. **Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and engineering specialization to the solution of complex engineering problems.
2. **Problem analysis**: Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural, sciences and engineering sciences.
3. **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.
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.
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.
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.
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.
8. **Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work**: Function effectively as an individual, and as a member or leader in teams, and in multidisciplinary settings.
10. **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.
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.
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.

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 n civil engineering domain

Course Instructor	Course Coordinator	Module Coordinator	HOD
Eeshwar Ram. J	Eeshwar Ram. J	(J RANGAIAH)	(Dr. K. V. RAMANA)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (AI&ML)
COURSE HANDOUT
PART - A

PROGRAM	: B.Tech. - VII-Sem. – CSE (AI&ML) – A Section
ACADEMIC YEAR	: 2025-26
COURSE NAME & CODE	: Management Science for Engineers – 20HS02
L-T-P STRUCTURE	: 4-0-0
COURSE CREDITS	: 3
COURSE INSTRUCTOR	: Dr. A.Nageswara Rao Sr. Assistant Professor
COURSE COORDINATOR	: Dr. A.Nageswara Rao, Sr. Assistant Professor
PER-REQUISITE	: NIL

COURSE EDUCATIONAL OBJECTIVES:
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:
After completion 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	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	3	3	3	2	3				3			3		3	
CO2	3	3	1	2	1				3			3		3	
CO3	3	3	3	2	1				3			3		3	
CO4	3	2	3	2	3				1			3		3	
CO5	2	3	3	2	1				1			3		3	

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

BOS APPROVED TEXT BOOKS:
   1. Dr. A.R.Aryasri, Management Science, TMH, 10th edition, 2012
References:
   1. Koontz & weihrich – Essentials of management, TMH, 10th edition, 2015
   2. Stoner, Freeman, Gilbert, Management, 6th edition Pearson education, New Delhi, 2004
   3. O.P. Khana, Industrial engineering and Management L.S.Srinath, PERT & CPM

Part-B
COURSE DELIVERY PLAN (LESSON PLAN): Section-C
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 Outcome COs	Text Book followed	HOD Sign Weekly
1.	Introduction To Management	1	30.06.2025		TLM1	CO1	T1	
2.	Definition, Nature, Importance of management	1	02.07.2025		TLM1	CO1	T1	
3.	Functions of Management	1	03.07.2025		TLM1	CO1	T1	
4.	Taylor's scientific management theory	1	04.07.2025		TLM1	CO1	T1	
5.	Fayal's principles of management	1	07.07.2025		TLM3	CO1	T1	
6.	Contribution of Elton mayo, Maslow	1	09.07.2025		TLM1	CO1	T1	
7.	Herzberg, Douglas MC Gregor principles of management	1	10.07.2025		TLM1	CO1	T1	
8.	Basic Concepts of Organization, Authority, Responsibility	1	11.07.2025		TLM1	CO1	T1	
9.	Delegation of Authority, Span of control	1	14.07.2025		TLM1	CO1	T1, R1	
10.	Departmentation and Decentralization, Organization structures	1	16.07.2025		TLM1	CO1	T1, R1	
11.	Line and Functional staff organization,	1	17.07.2025		TLM1	CO1	T1, R1	
12.	Committee and Matrix organization	1	18.07.2025		TLM1	CO1	T1	
No. of classes required to complete UNIT-I		**12**			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	Learning Outcome COs	Text Book followed	HOD Sign Weekly
13.	Introduction	1	21.07.2025		TLM1	CO2	T1, R3	
14.	Plant location	1	23.07.2025		TLM1	CO2	T1, R3	
15.	Factors influencing location	1	24.07.2025		TLM1	CO2	T1, R3	
16.	Principles of plant layouts	1	25.07.2025		TLM1	CO2	T1, R3	
17.	Types of plant layouts	1	28.07.2025		TLM1	CO2	T1, R3	
18.	Methods of production	1	30.07.2025		TLM3	CO2	T1, R3	
19.	Work study	1	31.07.2025		TLM1	CO2	T1	

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
20.		1	01.08.2025		TLM1	CO2	T1	
21.	Basic procedure involved in method study	1	04.08.2025		TLM1	CO2	T1	
22.	Work measurement	1	06.08.2025		TLM3	CO2	T1	
No. of classes required to complete UNIT-II		**10**			No. of classes taken:			

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	Learning Outcome COs	Text Book followed	HOD Sign Weekly
23.	Introduction, Concept of Quality	1	07.08.2025		TLM1	CO3	T1	
24.	Quality Control functions	1	08.08.2025		TLM1	CO3	T1, R1	
25.	Meaning of SQC, Variables and attributes	1	11.08.2025		TLM1	CO3	T1, R1	
26.	X chart, R Chart	1	13.08.2025		TLM1	CO3	T1	
27.	C Chart, P Chart	1	14.08.2025		TLM3	CO3	T1, R1	
28.	Simple problems	1	18.08.2025		TLM1	CO3	T1, R1	
29.	Acceptance sampling	1	20.08.2025		TLM1	CO3	T1	
30.	Sampling plans	1	21.08.2025		TLM1	CO3	T1, R1	
31.	Deming's contribution to quality	1	22.08.2025		TLM1	CO3	T1, R1	
Technical Training Classes 25.08.2025 to 06.09.2025 & MID-I 08.09.2025 to 13.09.2025								
32.	Materials management Meaning and objectives	1	15.09.2025		TLM1	CO3	T1	
33.	Inventory control	1	17.09.2025		TLM3	CO3	T1	
34.	Need for inventory control	1	18.09.2025		TLM1	CO3	T2	
35.	Purchase procedure, Store records	1	19.09.2025		TLM1	CO3	T1	
36.	EOQ, ABC analysis	1	22.09.2025		TLM1	CO3	T1, R2	
37.	Stock levels	1	24.09.2025		TLM1	CO3	T1, R2	
No. of classes required to complete UNIT-III		**15**			No. of classes taken:			

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	Learning Outcome COs	Text Book followed	HOD Sign Weekly
38.	Introduction	1	25.09.2025		TLM1	CO4	T1	
39.	Concepts of HRM	1	26.09.2025		TLM1	CO4	T1	
40.	Basic functions of HR manager	1	29.09.2025		TLM1	CO4	T1, R2	

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
41.	Man power planning	1	01.10.2025		TLM3	CO4	T1, R2	
42.	Recruitment	1	03.10.2025		TLM1	CO4	T1, R2	
43.	Selection,	1	06.10.2025		TLM1	CO4	T1, R1	
44.	Training & developmemt	1	08.10.2025		TLM1	CO4	T1, R1	
45.	Placement	1	09.10.2025		TLM1	CO4	T1	
46.	Wage and salary administration	1	10.10.2025		TLM3	CO4	T1, R1	
47.	Promotion, Transfers Separation	1	13.10.2025		TLM1	CO4	T1, R1	
48.	Performance appraisal	1	15.10.2025		TLM1	CO4	T1	
49.	Job evaluation and merit rating	1	16.10.2025		TLM3	CO4	T1	
No. of classes required to complete UNIT-IV		**12**			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	Learning Outcome COs	Text Book followed	HOD Sign Weekly
50.	Introduction	1	17.10.2025		TLM1	CO5	T1,R2	
51.	Early techniques in project management	1	20.10.2025		TLM1	CO5	T1, R2	
52.	Network analysis	1	22.10.2025		TLM1	CO5	T1,R2	
53.	Programme Evaluation and Review Technique (PERT)	1	23.10.2025		TLM1	CO5	T1,R2	
54.	Problems	1	24.10.2025		TLM1	CO5	T1,R2	
55.	Critical path method (CPM)	1	27.10.2025		TLM1	CO5	T1, R2	
56.	Identifying critical path	1	29.10.2025		TLM1	CO5	T1,R2	
57.	Probability of completing project within given time	1	30.10.2025		TLM1	CO5	T1,R2	
58.	Project cost analysis	1	31.10.2025		TLM1	CO5	T1,R2	
59.	project crashing	1	03.11.2025		TLM1	CO5	T1, R2	
60.	Beyond Syllabus	1	05.11.2025					
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

Part – C

EVALUATION PROCESS:

Evaluation Task	COs	Marks
Assignment 1	1	A1=5
Assignment 2	2	A2=5
I-Mid Examination	1,2,3	B1=15
Quiz – 1	1,2,3	Q1=10
Assignment 3	3	A3=5
Assignment 4	4	A4=5
Assignment 5	5	A5=5
II-Mid Examination	3,4,5	B2=15
Quiz – 2	3,4,5	Q2=10
Evaluation of Assignment: A=(A1+A2+A3+A4+A5)/5	1,2,3,4,5	A=5
Evaluation of Mid Marks: B=75% of Max(B1,B2)+25% of Min(B1,B2)	1,2,3,4,5	B=15
Evaluation of Quiz Marks: Q=75% of Max(Q1,Q2)+25% of Min(Q1,Q2)	1,2,3,4,5	Q=10
Cumulative Internal Examination: A+B+Q	**1,2,3,4,5**	**CIE=30**
Semester End Examinations	**1,2,3,4,5**	**SEE=70**
Total Marks: CIE+SEE	**1,2,3,4,5**	**100**

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):

PEO1: Pursue higher education, entrepreneurship and research to compete at global level.
PEO2: Design and develop products innovatively in the area of computer science and engineering and in Other allied fields.
PEO3: Function effectively as individuals and as members of a team in the conduct of interdisciplinary Projects and even at all the levels with ethics and necessary attitude.
PEO4: Serve ever-changing needs of the society with a pragmatic perception.

PROGRAMME OUTCOMES (POs):

Engineering Graduates will be able to:
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 solutions 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 ring 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.

PROGRAM SPECIFIC OUTCOMES (PSOS):

PSO1: The ability to apply Software Engineering practices and strategies in software project development using open source programming environment for the success of organization.

PSO2: The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.

PSO3: To inculcate an ability to analyze, design and implement database applications.

Dr. A.Nageswara Rao	Dr. A.Nageswara Rao	Mr. J. Subba Reddy	Dr. M.B.S.Sreekara Reddy
Course Instructor	Course Coordinator	Module Coordinator	HoD

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING(AUTONOMOUS)
Accredited by NAAC with 'A' Grade
An ISO 21001:2018,14001:2015,50001:2018 Certified Institution
Approved by AICTE, New Delhi and Affiliated to JNTUK, Kakinada
L.B. REDDY NAGAR, MYLAVARAM, NTR DIST., A.P.-521 230.
hodcsm@lbrce.ac.in, csmoffice@lbrce.ac.in, Phone: 08659-222 933, Fax: 08659-222931
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING (AI&ML)

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr.L.Narendra
Course Name & Code   : Continuous Integration and Continuous Delivery using DevOps(20CSS4)
L-T-P Structure   : 1-0-2   **Credits:** 2
Program/Sem/Sec   : B.Tech., CSE-AI&ML, VII-Sem., .   **A.Y.:** 2025-26

PRE-REQUISITE: Basic knowledge of certain basic programming languages such as Java, and Python.

COURSE EDUCATIONAL OBJECTIVES (CEOs):

　　This course is designed to provide the core education necessary to build your DevOps vocabulary and to understand its principles and practices. With the help of key DevOps concepts and terminology, real-life case studies, examples and interactive group discussions and exercises, you will acquire a fundamental understanding of DevOps.

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

CO1	Understand the why, what, and how of DevOps adoption(**Understand – L2**)
CO2	Attain literacy on DevOps(**Apply L3**)
CO3	Align capabilities required in the team and create an automated CICD pipeline using a stack of tools(**Apply L3**)
CO4	Improve individual / teamwork skills, communication & report writing skills with ethical values.

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

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

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

　　　　　　　　1- Low　　　　　　　**2 –**Medium　　　　　**3-** High

REFERENCE BOOKS:

R1	Learning Continuous Integration with Jenkins: A beginner's guide to implementing Continuous Integration and Continuous Delivery using Jenkins - Nikhil Pathania ,Packt publication[https://www.amazon.in/Learning-Continuous-Integration-JenkinsPathania/dp/1785284835]
R2	Jenkins 2 – Up and Running: Evolve Your Deployment Pipeline for Next Generation Automation - Brent Laster, O'Reilly publication [https://www.amazon.in/Jenkins-2-Running-Brent-Laster/dp/1491979593]
R3	https://infyspringboard.onwingspan.com/web/en/login?ref=%2Fapp%2Ftoc%2Flex_auth_013382690411003904735_shared%2Foverview[Software Engineering and Agile softwaredevelopment]
R4	https://infyspringboard.onwingspan.com/web/en/login?ref=%2Fviewer%2Fhtml%2Flex_auth_0135015781949767676810467[Development & Testing with Agile: Extreme Programming]
R5	https://infyspringboard.onwingspan.com/web/en/login?ref=%2Fviewer%2Fhtml%2Flex_auth_01353898917192499226_shared[DevOps CICD]

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Module-1	4	05-07-2025		**DM5**	
2.	Module-2	4	12-07-2025		**DM5**	
3.	Module-3	4 4	19-07-2025 26-07-2025		**DM5**	
4.	Module-4	4	02-08-2025		**DM5**	
5.	Module-5	4	09-08-2025 16-08-2025		**DM5**	
6.	Module-6	4	23-08-2025		**DM5**	
7.	Module-7	4	20-09-2025		**DM5**	
8.	Module-8	4 4	27-09-2025 04-10-2025		**DM5**	
9.	Module-9	4	11-10-2025		**DM5**	
10.	Module-10	4	18-10-2025		**DM5**	
11.	Module-11	4	25-10-2025		**DM5**	
12.	Module-12	4 4	01-11-2025 08-11-2025		**DM5**	
13.	Internal exam	4	15-11-2025			

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

PART-C

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 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
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.L.Narendra	Mr.S.Srinivasa Reddy	Dr.Y.V.B.Reddy	Dr.S.Jayaprada
Signature				