



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.

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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 antilght '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 Education, 1999.
T2 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 Forensics", 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		No. of classes taken:		

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		23.08.2025		TLM1	

	Encapsulating Security Payload,				
38	Tunnel and Transport Modes	1	06.10.2025		TLM1
39	Combining Security Associations, Key Exchange	1	07.10.2025		TLM1
40	Cryptographic Suites	1	09.10.2025		TLM1
41	Unit Overview and Discussion	1	10.10.2025		TLM1
Technical Training(25.08.2025 To 20.09.2025) MID - I (22.09.2025 TO 27.09.2025)					
No. of classes required to complete UNIT-III		7		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
42	Introduction	1	11.10.2025		TLM1	
43	Web Security Requirements	1	13.10.2025		TLM1	
44	Secure Socket Layer (SSL)Architecture	1	14.10.2025		TLM1	
45	Secure Socket Layer (SSL)Architecture	1	16.10.2025		TLM1	
46	SSL Handshake Protocol	1	17.10.2025		TLM1	
47	Tutorial	2	18.10.2025 & 21.10.2025			
48	Transport Layer Security	2	23.10.2025 & 24.10.2025		TLM1	
49	Secure Electronic Transaction (SET)	2	25.10.2025 & 27.10.2025		TLM1	
50	Payment Processing	1	28.10.2025		TLM1	
51	HTTPs. HTTP vs HTTPs	1	30.10.2025		TLM1	
52	HTTPs. HTTP vs HTTPs	1	31.10.2025		TLM1	
53	Unit Overview and Discussion	1	1.11.2025		TLM1	
No. of classes required to complete UNIT-IV		15		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
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59	Introduction	1	3.11.2025		TLM2	
60	Intruder Behaviour Patterns	1	4.11.2025		TLM2	
61	Intrusion Techniques	1	6.11.2025		TLM2	
62	Honeypot	1	7.11.2025		TLM2	
63	Malicious Software	1	8.11.2025		TLM2	
64	Viruses	1	10.11.2025		TLM2	
65	Related Threats	1	11.11.2025		TLM2	
66	DDoS	1	13.11.2025		TLM2	
67	Firewall Design principles	2	14.11.2025 & 15.11.2025		TLM2	
68	Trust Management System	2	17.11.2025 & 18.11.2025		TLM2	
69	Introduction to Digital forensics	1	20.11.2025		TLM2	
70	Unit 1,2,3,4&5 Overview and Discussion	1	21.11.2025		TLM1	
71	Unit 1,2,3,4&5 Overview and Discussion	1	22.11.2025		TLM1	
No. of classes required to complete UNIT-V		15		No. of classes taken:		
MID - II (24.11.2025 TO 29.11.2025)						

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 (R17 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 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	Mrs. D.MANGAMMA	Mrs K Vinaya Sree Bai	Dr Ch Rajendra Babu	Dr. S.JAYAPRADA
Signature				



LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)

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

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

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Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr. Shaik Salma Asiya Begum

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	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	30-06-2025		TLM1	CO1	
2	Knowledge in Speech and Language Processing	2	02-07-2025 03-07-2025		TLM2	CO1	
3	Ambiguity; Models and Algorithms	2	04-07-2025 05-07-2025		TLM2	CO1	
4	Language, Thought and Understanding;	2	07-07-2025 09-07-2025		TLM2	CO1	
5	History Regular Expressions Regular Expression	2	10-07-2025 11-07-2025		TLM2	CO1	
6	Words; Corpora; Text Normalization	2	12-07-2025 14-07-2025		TLM2	CO1	
7	Minimum Edit Distance	2	16-07-2025 17-07-2025		TLM2	CO1	
8	Tutorial on Ambiguity and Regular Expressions	2	18-07-2025 19-07-2025		TLM3	CO1	
9		1	21-07-2025		TLM7	CO1	

No. of classes required to complete UNIT-I	16	No. of classes taken:
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UNIT-II: N-gram Language Models

UNIT-11: 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	25-07-2025 28-07-2025		TLM2	CO2	
12	Smoothing: Laplace Smoothing	2	30-07-2025 31-07-2025		TLM2	CO2	
13	Add-k Smoothing	2	01-08-2025 02-08-2025		TLM2	CO2	
14	Backoff and Interpolation	2	04-08-2025 06-08-2025		TLM2	CO2	
15	Kneser-Ney Smoothing	1	07-08-2025		TLM2	CO2	
16	Tutorial on N-Gram Language Models	1	08-08-2025		TLM3	CO2	
17		1	09-08-2025		TLM7	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
18	Part-I: Introduction to NLTK	2	11-08-2025 13-08-2025		TLM1	CO3	
19	Tokenizing; Filtering Stop words; Stemming	2	14-08-2025 18-08-2025		TLM2	CO3	
20	Tagging parts of speech; Lemmatizing;	2	20-08-2025 21-08-2025		TLM2	CO3	
21	Chunking	2	22-08-2025 23-08-2025		TLM2	CO3	
22	Chinking Part-II: Using Named Entity Recognition (NER)	2	06-10-2025 08-10-2025		TLM2	CO3	

23	Getting Text to Analyze	2	09-10-2025 10-10-2025		TLM2	CO3	
25	Using a Concordance	2	11-10-2025 13-10-2025		TLM2	CO3	
26	Making a Dispersion Plot.	2	15-10-2025 16-10-2025		TLM2	CO3	
27	Tutorial on Natural language processing tools	1	17-10-2025		TLM3	CO3	
28		1	18-10-2025		TLM7	CO3	
No. of classes required to complete UNIT-3		18	No. of classe taken:				

UNIT-IV: Information Extraction

UNIT-4: 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
29	Relation Extraction Algorithms	1	22-10-2025		TLM1	CO4	
30	Using Patterns to extract relations	2	23-10-2025 24-10-2025		TLM2	CO4	
31	Relation extraction via supervised learning	2	25-10-2025 27-10-2025		TLM2	CO4	
32	Semi supervised relation extraction via bootstrapping	2	29-10-2025 30-10-2025		TLM2	CO4	
33	Distant Supervision for Relation Extraction	2	31-10-2025 01-11-2025		TLM2	CO4	
34	Evaluation of Relation Extraction	2	03-11-2025 05-11-2025		TLM2	CO4	
35	Extracting Times	2	06-11-2025 07-11-2025		TLM2	CO4	
36	Extracting Events and their Times; Template Filling	2	08-11-2025 10-11-2025		TLM2	CO4	
37	Tutorial on Information Extraction	1	12-11-2025		TLM3	CO4	
38		1	13-11-2025		TLM7	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
39	Defining Word Senses, How many senses do words have	1	14-11-2025		TLM1	CO5	
40	Relations between senses	1	15-11-2025		TLM2	CO5	
41	WordNet: Sense relations in WordNet	1	17-11-2025		TLM2	CO5	
42	Word Sense Disambiguation	1	19-11-2025		TLM2	CO5	

43	Alternate WSD algorithms and Tasks	1	20-11-2025		TLM2	CO5
44	Alternate WSD algorithms and Tasks	1	21-11-2025		TLM2	CO5
45	Tutorial /Activity	1	22-11-2025		TLM3/ TLM7	CO5
No. of classes required to complete UNIT-5		07	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
TLM7	Activity Based Learning		

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. Shaik Salma Asiya	Mrs. B.Swathi	Dr K.Devi Priya	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

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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	

	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	20-08-2025		TLM1	
27.	Block chain Genomics	1	21-08-2025		TLM1	
28.	Bit coin MOOCs	1	22-08-2025		TLM1	
29.	Tutorial-III	1	23-08-2025		TLM3	
No. of classes required to complete UNIT-III		12		No of classes taken		
Technical Training		23-08-2025 to 20-09-2025				
Mid-1		22-09-2025 to 27-09-2025				

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	29-09-2025		TLM1	
31.	IOTA	1	30-09-2025		TLM1	
32.	The real need for mining	1	02-10-2025		TLM2	
33.	consensus	1	03-10-2025		TLM1	
34.	Byzantine	1	06-10-2025		TLM2	

	Generals Problem					
35.	Consensus as a distributed coordination problem	2	07-10-2025 & 10-10-2025		TLM1	
36.	Coming to private or permissioned block chains	2	13-10-2025 & 14-10-2025		TLM2	
37.	Introduction to Hyper ledger	2	16-10-2025 & 17-10-2025		TLM1	
38.	Currency & Token	2	20-10-2025 & 21-10-2025		TLM1	
39.	Campus coin	2	23-10-2025 & 24 -10-25		TLM2	
40.	Coin drop as a strategy for Public adoption	1	27-10-25		TLM1	
41.	Currency Multiplicity	1	29-10-25		TLM2	
42.	Demurrage currency	1	3-11-2025		TLM1	
43.	Tutorial-IV	1	5-11-2025		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	3	6-11-2025 & 8-11-2025		TLM1	
45.	Business model challenges	2	11-11-2025		TLM2	
46.	Scandals perception	1	12-11-2025		TLM1	
47.	and Public perception	1	15-11-2025			
48.	Government Regulations	2	17.11.2025		TLM2	
49.	Uses of Block chain in E-Governance	1	19.11.2025		TLM1	
50.	Land Registration	1	20.11.2025		TLM1	
51.	Medical Information Systems.	1	21.11.2025		TLM2	

	Tutorial – V / Quiz - V	1	22-11-2025		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	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. John Wesily	Dr. K. Phaneendra		Dr. S. Jayaprada
Signature				



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(AUTONOMOUS)

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

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

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

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : 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,	

	lamps				TLM2	
25	Comparision between tungsten &flurosent 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	Technical training	25 -08-2025 to 20-09-2025				
32	MID-I	22-09-2025 to 27-09-2025				
33	Factors affecting selection of motor	1	29-09-2025		TLM2	
34	Types of loads	1	04-10-2025		TLM2	
35	Industrial applications	1	06-10-2025		TLM1, TLM2	
36	Transient Characteristics of drives	1	08-10-2025		TLM1, TLM2	
37	Steady state characteristics of drives	1	09-10-2025		TLM1, TLM2	
39	Size of motor, Load Equalization	1	11-10-2025		TLM1, TLM2	
40	Assignment/Quiz	1	13-10-2025		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
41	Introduction	1	15-10-2025		TLM2	
42	Requirement of an ideal traction system	1	16-10-2025		TLM2	
43	Supply system for electric traction	1	18-10-2025		TLM2	
44	Train movement	1	22-10-2025		TLM2	
45	mechanism of train movement	1	23-10-2025		TLM2	
46	Traction motors	1	25-10-2025		TLM1, TLM2	
47	Modern trends in electric traction	1	27-10-2025		TLM2, TLM6	
48	Automation in traction	1	29-10-2025		TLM1, TLM2	
49	Speed time curves for different services	1	30-10-2025		TLM1, TLM2	

50	Trapezoidal speed time curves	1	01-11-2025		TLM1, TLM2	
51	Quadrilateral speed time curves	1	03-11-2025		TLM1	
52	Problems on train movement	1	05-11-2025		TLM1	
53	Assignment/quiz	1	06-11-2025		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
54	Desirable characteristics	1	10-11-2025		TLM2	
55	Types of Tariff, Flat rate, Block-rate	1	12-11-2025		TLM2	
56	Numericals on types of Tariff	1	13-11-2025		TLM3	
57	KVA maximum demand	1	15-11-2025		TLM1, TLM2	
58	Time of Day tariff	1	17-11-2025		TLM1, TLM2	
59	Disadvantages of low power factor, Advantages of improved p.f	1	19-11-2025		TLM1, TLM2	
60	Improvement devices , Power factor improvement using static capacitor	1	20-11-2025		TLM1, TLM2	
61	Most economical power factor	1	22-11-2025		TLM2	
62	Assignment/quiz, REVISION	1	22-11-2025		TLM2	
63	MID-II	24-11-2025 to 29-11-2025				
No. of classes required to complete UNIT-V : 09					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
63	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	20-09-2025	2 W
I Mid Examinations	22-09-2025	27-09-2025	1 W
II Phase of Instructions	29-09-2025	22-11-2025	9 W
II Mid Examinations	24-11-2025	29-11-2025	1 W
Preparation and Practicals	01-12-2025	06-12-2025	1 W
Semester End Examinations	08-12-2025	20-12-2025	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



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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, Frankln J. Agardy, "Environmental Engineering", John Wiley & Sons, 5th Edition, 2003.
- T2** I.M. Prahlada 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:

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

PROGRAM SPECIFIC OUTCOMES (PSOs)

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

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



LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(An Autonomous Institution since 2010)

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

L.B. Reddy Nagar, Mylavaram, NTR District, Andhra Pradesh - 521230



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	
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 20.09.2025 & MID-I 22.09.2025 to 27.09.2025								
32.	Materials management Meaning and objectives	1	29.09.2025		TLM1	CO3	T1	
33.	Inventory control	1	01.10.2025		TLM3	CO3	T1	
34.	Need for inventory control	1	03.10.2025		TLM1	CO3	T2	
35.	Purchase procedure, Store records	1	06.10.2025		TLM1	CO3	T1	
36.	EOQ, ABC analysis	1	08.10.2025		TLM1	CO3	T1, R2	
37.	Stock levels	1	09.10.2025		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	10.10.2025		TLM1	CO4	T1	
39.	Concepts of HRM	1	13.10.2025		TLM1	CO4	T1	
40.	Basic functions of HR manager	1	15.10.2025		TLM1	CO4	T1, R2	
41.	Man power planning	1	16.10.2025		TLM3	CO4	T1, R2	
42.	Recruitment	1	17.10.2025		TLM1	CO4	T1, R2	
43.	Selection,	1	20.10.2025		TLM1	CO4	T1, R1	

44.	Training & development	1	22.10.2025		TLM1	CO4	T1, R1	
45.	Placement	1	23.10.2025		TLM1	CO4	T1	
46.	Wage and salary administration	1	24.10.2025		TLM3	CO4	T1, R1	
47.	Promotion, Transfers Separation	1	27.10.2025		TLM1	CO4	T1, R1	
48.	Performance appraisal	1	29.10.2025		TLM1	CO4	T1	
49.	Job evaluation and merit rating	1	30.10.2025		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	31.10.2025		TLM1	CO5	T1,R2	
51.	Early techniques in project management	1	03.11.2025		TLM1	CO5	T1, R2	
52.	Network analysis	1	05.11.2025		TLM1	CO5	T1,R2	
53.	Programme Evaluation and Review Technique (PERT)	1	06.11.2025		TLM1	CO5	T1,R2	
54.	Problems	1	07.11.2025		TLM1	CO5	T1,R2	
55.	Critical path method (CPM)	1	10.11.2025		TLM1	CO5	T1, R2	
56.	Identifying critical path	1	12.11.2025		TLM1	CO5	T1,R2	
57.	Probability of completing project within given time	1	13.11.2025		TLM1	CO5	T1,R2	
58.	Project cost analysis	1	14.11.2025		TLM1	CO5	T1,R2	
59.	project crashing	1	17.11.2025		TLM1	CO5	T1, R2	
60.	Beyond Syllabus	1	19.11.2025					
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: $B=75\% \text{ of Max}(B1,B2)+25\% \text{ of Min}(B1,B2)$	1,2,3,4,5	B=15
Evaluation of Quiz Marks: $Q=75\% \text{ of Max}(Q1,Q2)+25\% \text{ of Min}(Q1,Q2)$	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)

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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_01350157819497676810467 [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	02-07-2025 05-07-2025		DM5	
2.	Module-2	4	09-07-2025 12-07-2025		DM5	
3.	Module-3	4	16-07-2025 19-07-2025		DM5	
4.	Module-4	4	23-07-2025 26-07-2025		DM5	
5.	Module-5	4	30-07-2025 02-08-2025		DM5	
6.	Module-6	4	06-08-2025 09-08-2025		DM5	
7.	Module-7	4	13-08-2025 16-08-2025		DM5	
8.	Module-7	4	20-08-2025 23-08-2025		DM5	
9.	Module-8	4	30-08-2025 03-09-2025		DM5	
10.	Module-8	4	06-09-2025 10-09-2025		DM5	
11.	Module-9	4	13-09-2025 17-09-2025		DM5	
12.	Module-9	4	20-09-2025 01-10-2025		DM5	
13.	Module-10	4	04-10-2025 08-10-2025		DM5	

14.	Module-10	4	15-10-2025 18-10-2025		DM5	
15	Module-11	4	22-10-2025 25-10-2025		DM5	
16	Module-11	4	29-10-2025 01-11-2025		DM5	
17	Module-12	4	5-11-2025 8-11-2025		DM5	
18	Module-12	4	12-11-2025 15-11-2025		DM5	
19	Internal Exam	4	19-11-2025 22-11-2025			

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				