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.
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DEPARTMENT OF COMPUTER SCIENCE &ENGINEERING

COURSE HANDOUT

PROGRAM : B.Tech. V- Sem. (AI&ML)

ACADEMICYEAR : 2023-24

COURSENAME&CODE : **ComputerNetworks–20CS12**

L-T-PSTRUCTURE : **3**-0-0

COURSE CREDITS : 3

COURSEINSTRUCTOR : **Mr. R. Ashok**

COURSECOORDINATOR : **Mr. R. Ashok**

PRE-REQUISITE: Basic Computer Fundamentals and Concepts

COURSEOBJECTIVE: The Objective of the course is to provide a foundation to understand computer networks using layered architectures. It also helps students to understand the various network models, addressing concept, routing protocols and design aspects of computer networks.

COURSEOUTCOMES (CO): After the completion of this course, student will be able to:

CO1: Demonstrate the modern network architectures from a design perspective (Understand-L2)

CO2: Apply various Data Link layer design issues and error detection &correction techniques to solve collisions problems. (Apply-L3)

CO3: Demonstrate the network Layer functionalities **(Understand-L2)**

CO4: Outline the functions of transport layer protocols (Understand-L2)

CO5: Examine different application layer protocols. **(Understand-L2)**

COURSEARTICULATIONMATRIX (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	PS O1	PS O2	PS O3
CO1	2	2	2											1	
CO2	1	2	2									1		1	
CO3	1	3	3									1		1	
CO4	2	3	3	1								1	1		
CO5	2	2	2									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:

1. Behrouz A. Forouzan, , "Data Communication and Networking", McGraw-Hill, 4th Edition, 2011.
2. Andrew S. Tanenbaum, "Computer Networks", Pearson New International Edition, 8th Edition, 2013.

REFERENCE BOOKS:

1. William Stallings, "Data and Computer Communication", Pearson Prentice Hall India, 8th Edition.
2. Douglas Comer, Internetworking with TCP/IP, Prentice Hall of India, Volume 1, 6th Edition, 2009.
3. Richard Stevens, "TCP/IP Illustrated", Addison-Wesley, Volume 1, 2001.
4. http://www.cse.iitk.ac.in/users/dheeraj/cs425/
5. http://www.tcpipguide.com/free/t_OSIReferenceModelLayers.htm

COURSE DELIVERY PLAN (LESSON PLAN)

UNIT-I

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 Computer networks	1	04-7-23		TLM2	CO1	T1,T2	
2.	**Data Communication Components**	1	05-7-23		TLM2	CO1	T1	
3.	Representation of data and its flow Networks	1	06-7-23		TLM2	CO1	T1	
4.	Various Connection Topology	1	08-7-23		TLM2	CO1	T1,R3	
5.	Protocols And Standards	1	11-7-23		TLM2	CO1	T1,R3	
6.	OSI Model	1	12-7-23		TLM2	CO1	T1,R1	
7.	TCP/IP Model	1	13-7-23		TLM2	CO1	T1,R2	
8.	Transmission Media	2	18-7-23 19-7-23		TLM2	CO1	T1,T2	
9.	LAN: Wired LAN, Wireless LANs	1	20-7-23		TLM2	CO1	T1	
10.	Connecting LAN and Virtual LAN.	2	22-7-23 25-7-23		TLM2	CO1	T1	
No. of classes required to complete UNIT-I		12			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	Learning Outcome COs	Text Book followed	HOD Sign Weekly
11.	**DATA LINKLAYER AND MEDIUM ACCESS SUBLAYER**	1	26-7-23		TLM2	CO2	T1,R1	
12.	Error Detection and Error Correction-	1	27-7-23		TLM2	CO2	T1,R1	
13.	Block coding, Hamming Distance, CRC	1	28-7-23		TLM2	CO2	T1,R2	
14.	Flow Control and Error& control protocols	2	01-7-23 02-8-23		TLM2	CO2	T1,R3	
15.	Stop and Wait, Go back N & ARQ	1	03-8-23		TLM2	CO2	T1,R2	
16.	Selective Repeat ARQ	1	05-8-23		TLM2	CO2	T1,R2	
17.	Sliding Window & Piggybacking	2	08-8-23 09-8-23		TLM2	CO2	T1,R3	
18.	RandomAccess,Multiple accessprotocols-Pure ALOHA,SlottedALOHA	1	10-8-23		TLM2	CO2	T1,R3	
19.	CSMA/CD,CDMA/CA	2	12-8-23 16-8-23		TLM2	CO2	T1,R3	
No. of classes required tocompleteUNIT-II		**12**			No.ofclassestaken:			

UNIT-III:

S.No.	Topics to be covered	No. of Classes Required	Tentative Dateof Completion	Actual Dateof Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
20.	Network Layer	1	17-08-23		TLM2	CO3	T1,R3	
21.	Switching	1	19-08-23		TLM2	CO3	T1	
22.	Logical addressing—IPV4,IPV6	2	22-08-23 23-08-23		TLM2	CO3	T1	
23.	Address mapping—ARP	1	24-08-23		TLM2	CO3	T1	

24.	RARP,BOOTPand DHCP—Delivery	2	26-08-23 05-09-23		TLM2	CO3	T1,R2	
25.	Forwarding	1	07-09-23		TLM2	CO3	T1	
26.	Unicast Routing protocols.	3	12-09-23 13-09-23 14-09-23		TLM2	CO3	T1	
No. of classes required tocompleteUNIT-III		**11**			No.ofclassestaken:			

UNIT-IV:

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
27.	Transport Layer	1	16-09-23		TLM2	CO4	T1,R1	
28.	Process to Process Communication	2	19-09-23 20-09-22		TLM2	CO4	T1	
29.	User Datagram Protocol (UDP)	1	21-09-23		TLM2	CO4	T1	
30.	Transmission Control Protocol (TCP)	2	23-09-23 26-09-23		TLM2	CO4	T1	
31.	SCTP Congestion Control	1	27-09-23		TLM2	CO4	T1	
32.	Quality of Service	1	30-09-23		TLM2	CO4	T1	
33.	QoS improving techniques: Leaky Bucket and Token Bucket algorithm.	2	03-10-23 04-10-23		TLM2	CO4	T1	
No. of classes required to complete UNIT-IV		**10**			No. of classes taken:			

UNIT-V:

S.No.	Topicstobecovered	No. of Classes Required	Tentative Dateof Completion	Actual Dateof Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
34.	ApplicationLayer	1	05-10-23		TLM2	CO5	T1,R3	
35.	Domain Name Space(DNS),DDNS	2	07-10-23 10-10-23		TLM2	CO5	T1,R3	
36.	TELNET,EMAIL	2	11-10-23 12-10-23		TLM2	CO5	T1,R4	

37.	File Transfer Protocol (FTP)	1	14-10-23		TLM2	CO5	T1,R3	
38.	WWW,HTTP	2	17-10-23 18-10-23		TLM2	CO5	T1,R3	
39.	SNMP,Bluetooth, Firewalls	3	19-10-23 21-10-23 24-10-23		TLM2	CO5	T1,R3	
40.	Revision	2	25-10-23 26-10-23					
No. of classes required to complete UNIT-V		**13**			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-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-DescriptiveExamination(UNIT-III(RemainingHalfoftheSyllabus),IV&V)	M2=15
II-Quiz Examination(UNIT-III(Remaining Half of the Syllabus),IV&V)	Q2=10
MidMarks=80%ofMax((M1+Q1+A1),(M2+Q2+A2))+20%ofMin((M1+Q1+A1),(M2+Q2+A2))	M=30
CumulativeInternalExamination(CIE):M	30
SemesterEndExamination(SEE)	70
TotalMarks=CIE+SEE	100

PROGRAM OUTCOMES (Pos)

PO1	Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and anengineeringspecializationtothesolutionofcomplexengineeringproblems.
PO2	Problem analysis: Identify, formulate ,review research literature, and analyze complex Engineering problemsreachingsubstantiatedconclusionsusingfirstprinciplesofmathematics, 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,legalandculturalissuesandtheconsequentresponsibilitiesrelevanttotheprofessional 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 teamwork: 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 reportsanddesigndocumentation,makeeffectivepresentations,andgiveand Receive clear instructions.
PO11	Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one' s own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO12	Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Mr. R.Ashok	Dr.KNagaPrasanthi	Dr.D.V.Subbaiah	Dr.DVeeraiah
Signature				

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DEPARTMENT OF COMPUTER SCIENCE &ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : Dr. K DEVIPRIYA
Course Name & Code : Machine Learning (20AD04)
L-T-P Structure : 3-0-0 Credits : 3
Program/Sem/Sec : B.Tech., CSE(AI&ML), V-A A.Y: 2023-24

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

COURSE EDUCATIONAL OBJECTIVES (CEOs):

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

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

CO 1	Identify the characteristics of machine learning. (Understand- L2)
CO 2	Understand the Model building and evaluation approaches (Understand- L2)
CO 3	Apply regression algorithms for real-world Problems. (Apply- L3)
CO 4	Handle classification problems via supervised learning algorithms. (Apply- L3)
CO 5	Learn advanced learning techniques to deal with complex data (Apply- L3)

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

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	-	2	-	-	-	-	-	-	-	2	-	2	-
CO2	3	2	-	2	-	-	-	-	-	-	-	2	-	2	-
CO3	3	2	-	-	-	-	-	-	-	-	-	2	-	2	-
CO4	3	-	-	3	-	-	-	-	-	-	-	2	-	2	-
CO5	3	1	-	3	-	-	-	-	-	-	-	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:

1. Subramanian Chandramouli, Saikat Dutt, Amit Kumar Das, "Machine Learning", Pearson Education India ,1st edition,2015.

2. Tom M. Mitchell, "Machine Learning', MGH, 1997.

REFERENCE BOOKS:

1. Shai Shalev-Shwartz, ShaiBen David, "Understanding Machine Learning: From Theory to Algorithms", Cambridge
2. Peter Harington, "Machine Learning in Action" , Cengage, 1st edition, 2012.

3. Peter Flach, "Machine Learning: The art and science of algorithms that make sense of data", Cambridge university press,2012.
4. Jason Brownlee, "Machine Learning Mastery with Python Understand Your Data, Create Accurate Models and Work Projects End-To-End", Edition: v1.4, 2011.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN): Section C

UNIT-I : Introduction to Machine Learning and Preparing to Model

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction	1	6-7-2023		TLM1/TLM3/TLM5	
2.	Types of Machine Learning-supervise Learning	1	7-7-2023		TLM1	
3.	Unsupervised Learning	1	8-7-2023		TLM1	
4.	Reinforcement Learning	1	10-7-2023		TLM1	
5.	Applications of Machine Learning,	1	13-7-2023		TLM1	
6.	Issues in Machine Learning	1	14-7-2023		TLM1	
7.	Introduction, Machine Learning Activities	1	15-7-2023		TLM1	
8.	Basic Types of Data in Machine Learning	1	17-7-2023		TLM1	
9.	Exploring Structure of Data	1	20-7-2023		TLM1	
10.	Exploring Structure of Data	1	21-7-2023		TLM1	
11.	Data Quality and Remediation,	1	22-7-2023		TLM1	
12.	Data PreProcessing	1	24-7-2023		TLM3	
No. of classes required to complete UNIT-I		**12**		**No of classes taken**		

UNIT-II: Modelling & Evaluation, Basics of Feature 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
13	Introduction,	1	27-7-2023			
14.	selecting a Model, training a Model (for Supervised Learning),	1	28-7-2023,		TLM1	
15.	, Model Representation and Interpretability	1	3-8-2023		TLM1	
16.	Evaluating Performance of a Model.	1	4-8-2023		TLM1	

17.	Feature Transformation	1	5-8-2023		TLM1	
18.	Feature Construction	1	7-8-2023		TLM1	
19.	Feature Extraction	1	10-8-2023		TLM1	
20.	Principal Component Analysis (PCA),	1	11-8-2023		TLM1	
21.	Singular Value Decomposition	1	12-8-2023		TLM3	
22	Linear Discriminant Analysis (LDA), Feature Subset Selection	1	14-8-2023			
No. of classes required to complete UNIT-II		**10**		**No of classes taken**		

UNIT-III: Regression

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
23.	Introduction to regression analysis, Simple linear regression	1	17-8-2023		TLM1	
24.	Multiple linear regression	1	18-8-2023		TLM1	
25.	Assumptions in Regression Analysis, Main Problems in Regression Analysis	2	19-8-2023, 21-8-2023		TLM1	
26.	Improving Accuracy of the linear regression model, Polynomial Features	2	23-8-2023, 24-8-2023		TLM1	
27.	Polynomial Regression Model	1	4-9-2023, 7-9-2023		TLM1	
28.	Logistic Regression	1	8-9-2023, 9-9-2023,		TLM1	
29.	Regularization	1	11-9-2023, 14-9-23,		TLM1	
30.	Regularized Linear Regression	1	15-9-2023, 16-9-2023,		TLM1	
31.	Regularized Logistic Regression.	1	21-9-2023, 22-9-2023		TLM3	
No. of classes required to complete UNIT-III		**11**		**No of classes taken**		

UNIT-IV: Supervised Learning: Classification

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
32.	Supervised Learning Introduction and example	2	, 23-9-2023, 25-9-2023		TLM1	
33.	Classification Model	2	27-9-2023, 29-9-2023		TLM1	
34.	Classification Learning Steps	2	30-9-2023, 5-10-2023		TLM1	
35.	k-Nearest Neighbour (kNN)	2	6-10-2023, 9-10-2023		TLM1	
36.	Support vector Machines	2	12-10-2023 13-10-2023		TLM1	
37.	Random Forest model	2	14-10-23,		TLM3	
No. of classes required to complete UNIT-IV		**12**		**No of classes taken**		

UNIT-V: Other Types of Learning

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
38.	Bagging	1	16-10-2023		TLM1	
39.	Boosting	1	19-10-2023		TLM2	
40	Stacking and its impact on bias and variance	1	20-10-2023		TLM2	
41	AdaBoost	1	21-10-2023		TLM2	
42	,Gradient Boosting Machines	1	26-10-2023		TLM2	
43	XGBoost	1	27-10-2023		TLM2	
44	Reinforcement Learning- Q learning	1	28-10-2023		**TLM3**	
No. of classes required to complete UNIT-V		**07**		**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 (Unit-I , Unit-II , Unit-III)	A1=5
Assignment-II (Unit-III , Unit-IV , Unit-V)	A2=5

I-Mid Examination (Units-I & II)	M1=20
I-Quiz Examination (Units-I & II)	Q1=10
Assignment-III (Unit-III)	A3=5
Assignment-IV (Unit-IV)	A4=5
Assignment-V (Unit-V)	A5=5
II-Mid Examination (Units-III, IV & V)	M2=20
II-Quiz Examination (Units-III, IV & V)	Q2=10
Attendance	B=5
Assignment Marks = Best Four Average of A1, A2, A3, A4, A5	A=5
Mid Marks =75% of Max(M1,M2)+25% of Min(M1,M2)	M=20
Quiz Marks =75% of Max(Q1,Q2)+25% of Min(Q1,Q2)	B=10
Cumulative Internal Examination (CIE) : A+B+M+Q	40
Semester End Examination (SEE)	60
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.

Course Instructor	Course Coordinator	Module Coordinator	HOD
Dr.K DeviPriya	Dr.K DeviPriya	Dr.Y.B.Reddy	Dr.D.Veeriah

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr. N V NAIK
Course Name & Code **:** THEORY OF COMPUTATION & 20CS13
L-T-P Structure **: 3-0-0** **Credits:** 3
Program/Sem/Sec : B.Tech/V/AI&ML **A.Y.:** 2023-24

PREREQUISITE: Discrete Mathematical Structures

COURSE EDUCATIONAL OBJECTIVES (CEOs):

The objective of the course is to provide a formal connection between algorithmic problem solving and the theory of automata and languages, and develop them into a mathematical view towards algorithmic design and in general computation itself.

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

CO1	Construct finite automata for regular languages and prove it's equivalence **(Apply-L3)**
CO2	Construct regular expression for regular languages and prove the equivalence of regular expression and Finite Automata **(Apply-L3)**
CO3	Design Pushdown automata for the context free languages. **(Understand-L2)**
CO4	Design Turing Machine to model computational problems **(Apply-L3)**
CO5	Distinguish decidable and undecidable problems with the help of Turing machine **(Understand-L2)**

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		
CO2	3	2											1		
CO3	3	2													
CO4	3	2													
CO5	1	2													
1 - Low			**2 –**Medium								**3 -** High				

TEXTBOOKS:

T1 John E. Hopcroft, Rajeev Motwani and Jeffrey D. Ullman, "Introduction to Automata Theory, Languages, and Computation", Pearson Education Asia, 1997

REFERENCE BOOKS:

R1	Harry R. Lewis and Christos H. Papadimitriou, "Elements of the Theory of Computation", Pearson Education Asia,2000
R2	Dexter C. Kozen, "Automata and Computability", Springer,2011.
R3	Michael Sipser, "Introduction to the Theory of Computation", PWS Publishing,2005.
R4	John Martin, Introduction to Languages and The Theory of Computation, Tata McGraw Hill,2nd Edition,2003

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: FINITE AUTOMATA

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- Course Objective & Outcomes	1	04-07-2023		TLM1	
2.	Basic Concepts of Finite Automata	1	06-07-2023		TLM1	
3.	Finite automata Classification	1	07-07-2023		TLM1	
4.	DFA Construction	2	08-07-2023 11-07-2023		TLM1	
5.	NFA Construction	1	12-07-2023		TLM1	
6.	Equivalence of NFA & DFA	1	14-07-2023		TLM1	
7.	NFA with epsilon to NFA without epsilon	1	15-07-2023		TLM1	
8.	Minimization of Finite Automata	2	18-07-2023 19-07-2023		TLM1	
9.	Finite Automata with output	1	21-07-2023		TLM1	
10.	Construction of Moore and Melay Machine	2	22-07-2023 25-07-2023		TLM1	
11.	Equivalence of Moore and Melay	2	26-07-2023 28-07-2023		TLM1	
No. of classes required to complete UNIT-I: 15				**No. of classes taken:**		

UNIT-II: Regular Expression and Regular Languages

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.	Introduction to Regular Expressions	1	01-08-2023		TLM1	
13.	Construction of RE	1	02-08-2023		TLM1	
14.	RE to Finite Automata	1	04-08-2023		TLM1	
15.	FA to Regular expressions	1	05-08-2023		TLM1	
16.	Regular grammar, Construction	1	08-08-2023		TLM1	
17.	Parse Trees	1	09-08-2023		TLM1	
18.	Equivalence of grammar to Finite Automata	1	11-08-2023		TLM1	
19.	Pumping Lemma for regular languages	1	12-08-2023		TLM1	
20.	Closure Properties for Regular Language	1	16-08-2023		TLM1	
No. of classes required to complete UNIT-II: 09				**No. of classes taken:**		

UNIT-III: CONTEXT FREE GRAMMER AND PUSH DOWN AUTOMATA

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
21.	Context Free Grammer	1	18-08-2023		TLM1	
22.	Ambiguity of CFG	1	19-08-2023		TLM1	
23.	Simplification of CFG	1	22-08-2023		TLM1	
24.	CNF	1	23-08-2023		TLM1	
25.	GNF	2	25-08-2023 26-08-2023		TLM1	
26.	PDA Definition	1	05-09-2023		TLM1	
27.	Deterministic PDA and Non Deterministic PDA	1	08-09-2023		TLM1	
28.	Construction of PDA	1	09-09-2023		TLM1	
29.	CFG to PDA	1	12-09-2023		TLM1	
30.	PDA to CFG	1	13-09-2023		TLM1	
31.	Pumping lemma for CFL's	1	15-09-2023		TLM1	
32.	Closure properties of CFL's	1	16-09-2023		TLM1	
No. of classes required to complete UNIT-III: 13				**No. of classes taken:**		

UNIT-IV: Turing Machine

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
33.	Introduction, Basic Model of TM	1	20-09-2023		TLM1	
34.	Languages, closure properties	1	22-09-2023		TLM1	
35.	TM Construction	3	23-09-2023 26-09-2023 27-09-2023		TLM1	
36.	Variants of TM	2	29-09-2023 30-09-2023		TLM1	
37.	NDTM equivalence with DTM	2	03-10-2023 04-10-2023		TLM1	
38.	Unrestricted Grammar and its equivalence TM	1	06-10-2023		TLM1	
39.	TM as enumerators	2	07-10-2023 10-10-2023			
No. of classes required to complete UNIT-IV: 12				**No. of classes taken:**		

UNIT-V: Undecidability

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
40.	Introduction	1	11-10-2023		TLM1	
41.	Church Turing Thesis	1	13-10-2023		TLM1	
42.	Universal Turing Machine	1	14-10-2023		TLM1	
43.	The universal and diagonalization Languages	1	17-10-2023		TLM1	
44.	Reduction between Languages	1	18-10-2023		TLM1	
45.	Rice Theorem	1	21-10-2023		TLM1	
46.	PCP Problem	1	25-10-2023		TLM1	
47.	Undecidable problems about Languages	1	27-10-2023		TLM1	
No. of classes required to complete UNIT-V: 08				**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
1.	Phases of Compiler	1	28-10-2023		**TLM1**	

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

PART-C

EVALUATION PROCESS (R20 Regulation):

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

PART-D

PROGRAMME OUTCOMES (POs):

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	To inculcate algorithmic thinking, formulation techniques and visualization, leading to problem solving skills using different programming paradigms.
PSO 2	To inculcate an ability to analyze, design and implement data driven applications into the students
PSO 3	Develop an ability to implement various processes/methodologies/practices employed in design, validation, testing and maintenance of software products.

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	**Mr. N V NAIK**	**Dr. D.Veeraiah**	**Dr. S.Jayaprada**	**Dr. D.Veeraiah**
Signature				

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)

Accredited by NAAC 'A' Grade & NBA (Under Tier - I), ISO 9001:2015Certified Institution Approved by AICTE, New Delhi and Affiliated to JNTUK, Kakinada

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DEPARTMENT OF COMPUTER SCIENCE &ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : Mr.Ch. Srinivasa Rao

CourseName&Code :SOFTWAREENGINEERING&20IT

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

Program/Sem : B.Tech/V/AI&ML **A.Y.:** 2023-24

PREREQUISITE: Object Oriented Programming.

COURSE EDUCATIONAL OBJECTIVES (CEOs):

The objective of the course is to provide an understanding of different s/w process models and how to choose one among them by gathering the requirements from a client and specifying them. Using those requirements in the design of the software architecture based on the choices with the help of modules and interfaces. To enable s/w development, by using different testing techniques like unit, integration and functional testing, quality assurance can be achieved.

CO1	Understand the fundamentals of software engineering concepts and software Process models. **(Understand-L2)**
CO2	Apply the requirement elicitation techniques for preparing SRS and design engineering. **(Apply-L3)**
CO3	Understanding the basic building blocks of UML, Class, and object diagrams. **(Understand-L2)**
CO4	Apply behavioral models for real world applications. **(Apply-L3)**
CO5	Demonstrate different software testing approaches for testing real time applications. **(Understand-L2)**

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												3		
CO2		2											2	1	
CO3	3												3	2	
CO4		2												3	1
CO5	2	2													3
1 - Low						**2** –Medium							**3** - High		

TEXTBOOKS:

T1 Roger S. Pressman, "Software engineering- A practitioner 's Approach", TMH InternationalEdition, 6th edition, 2005.

T2 Grady Booch, James Rum baugh, Ivar Jacobson, "The Unified Modeling Language User Guide", PEARSON,4thImpression,2012.

REFERENCE BOOKS:

R1 Software Engineering- Concepts and practices: Ugrasen Suman, Cengage learning

R2 Object- oriented analysis and design using UML", Mahesh P. Matha, PHI

R3 Fundamentals of Software Engineering, Rajib Mall, Third Edition, PHI **R4 .**

https://onlinecourses.nptel.ac.in/noc20_cs68 **[1,2,3,4,5]**

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: Software and software 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
1.	CEOs and COs discussion	1	04-07-2023		TLM1	
2.	The evolving role of Software	1	06-07-2023		TLM1	
3.	Characteristics of Software	1	07-07-2023		TLM1	
4.	Importance of software Engineering,	1	08-07-2023		TLM1	
5.	Changing nature of software	1	11-07-2023		TLM1	
6.	Legacy Software	1	12-07-2023		TLM1	
7.	Software Myths	1	14-07-2023		TLM1	
8.	Software process model: layered. technology	1	15-07-2023		TLM1	
9.	Process framework The process and product	1	18-07-2023		TLM1	
10.	Waterfall model	1	19-07-2023		TLM1	
11.	Incremental model	1	21-07-2023		TLM1	
12.	Spiral and V model	1	22-07-2023		TLM1	
13.	Component based s/w development	1	25-07-2023		TLM1	
14.	Unified Process model	1	26-07-2023		TLM1	
No. of classes required to complete UNIT-I: 14				**No. of classes taken:**		

UNIT-II: Requirements Analysis and Software design

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
15.	Requirements gathering	1	28-07-2023		TLM1	
16.	Requirement analysis	1	01-08-2023		TLM1	
17.	Software requirement specification	1	02-08-2023		TLM1	
18.	SRS document case study	1	04-08-2023		TLM1	
19.	Overview of design process	1	05-08-2023		TLM1	
20.	Design concepts	1	08-08-2023		TLM1	
21.	Architectural concepts	1	09-08-2023		TLM1	
22.	Examples	1	11-08-2023		TLM1	
23.	Revision	1	12-08-2023		TLM1	
No. of classes required to complete UNIT-II: 9				**No. of classes taken:**		

UNIT-III: Design using UML

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
24.	Building Blocks of UML	1	16-08-2023		TLM1	
25.	Defining things	1	18-08-2023		TLM1	
26.	Defining relationships and diagrams	1	19-08-2023		TLM1	
27.	Common Mechanism in UML	1	22-08-2023		TLM1	
28.	Class diagrams	1	23-08-2023		TLM1	
29.	Examples	2	25-08-2023 26-08-2023		TLM1	
30.	Object diagrams and examples	1	05-09-2023		TLM1	
31.	Revision	1	08-09-2023		TLM1	
No. of classes required to complete UNIT-III: 09				**No. of classes taken:**		

UNIT-IV: Behavioral Modeling

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
32.	Interactions	1	09-09-2023		TLM1	
33.	Interaction diagrams	1	12-09-2023		TLM1	
34.	Use-cases	1	13-09-2023		TLM1	
35.	Use-case diagrams	1	15-09-2023		TLM1	
36.	Activity diagrams	1	16-09-2023		TLM1	
37.	Events and signals, state machines	1	20-09-2023		TLM1	
38.	processes and Threads, time, and space	1	22-09-2023		TLM1	
39.	State chart diagrams	2	23-09-2023 26-09-2023		TLM1	
40.	Component diagrams	1	27-09-2023		TLM1	
41.	Deployment diagrams	2	29-09-2023 30-09-2023		TLM1	
42.	Examples	2	03-10-2023 04-10-2023		TLM1	
43.	Revision	1	06-10-2023		TLM1	
No. of classes required to complete UNIT-IV: 15				**No. of classes taken:**		

UNIT-V: Testing Techniques

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.	Software testing fundamentals	1	07-10-2023		TLM1	
45.	Unit testing	1	10-10-2023		TLM1	
46.	Integration testing	1	11-10-2023		TLM1	
47.	Blackbox testing	1	13-10-2023		TLM1	
48.	Whitebox testing	1	14-10-2023		TLM1	
49.	Debugging	1	17-10-2023		TLM1	
50.	System testing	1	18-10-2023		TLM1	
51.	Examples	1	21-10-2023		TLM1	
52.	Revision	1	25-10-2023		TLM1	
No. of classes required to complete UNIT-V: 09				**No. of classes taken:**		

Content Beyond the Syllabus:

S No	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
50	Case study version control	1	27-10-2023		TLM1	
51	Case study test case preparation	1	28-10-2023		TLM1	

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

PART-C

EVALUATION PROCESS (R20 Regulation):

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

PART-D

PROGRAMME OUTCOMES (POs):

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	**Ch. Srinivasa Rao**	**Ch. Srinivasa Rao**	**Dr.S.Jayaprada**	**Dr. D. Veeraiah**
Signature				

DEPARTMENT OF MECHANICAL ENGINEERING
COURSE HANDOUT

Part-A

PROGRAM : B.Tech., V-Sem., AI &ML, A-Section

ACADEMIC YEAR : 2023-24

COURSE NAME & CODE : RENEWABLE ENERGY SOURCES- 20ME81

L-T-P STRUCTURE : 4-0-0

COURSE CREDITS : 3

COURSE INSTRUCTOR : K. Lakshmi Prasad

COURSE COORDINATOR : K. Lakshmi Prasad

PRE-REQUISITES: Nil

COURSE EDUCATIONAL OBJECTIVES (CEOs): To provide the insights on different non-conventional energy sources, potential, salient features and utilization of solar, wind, geothermal, ocean thermal energy, bio energy and direct energy conversion systems.

COURSE OUTCOMES (COs)

After completion of the course, the student will be able to

CO1: Compute the performance of solar energy harnessing devices and its energy scenario. **(Applying– L3)**

CO2: Apply the principles of energy conversion for wind and geothermal power generating plants. **(Applying - L3)**

CO3: Compare the power generating capacities of tidal energy, wave energy and ocean thermal energy plants. **(Understanding - L2)**

CO4: Illustrate the various biomass power generation system technologies. **(Understanding - L2)**

CO5: Comprehend the direct energy power generation systems. **(Understanding - L2)**

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	1	-	-	-	3	3	-	-	-	-	2	2	-	-
CO2	2	1	-	-	-	3	3	-	-	-	-	2	2	-	-
CO3	1	1	-	-	-	3	3	-	-	-	-	2	2	-	-
CO4	1	1	-	-	-	3	3	-	-	-	-	2	2	-	-
CO5	1	1	-	-	-	3	3	-	-	-	-	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).

BOS APPROVED TEXT BOOKS:

T1 G.D.Rai, Non-Conventional Energy Sources, 5th Edition 2011, Khanna Publishers, New Delhi, India.

T2 Kreith, F and Kreider, J. F., Principles of Solar Engineering, McGraw-Hill, 1978.

BOS APPROVED REFERENCE BOOKS:

R1 John Twidell&Tony Weir, Renewable Energy Resources – 2nd Edition, Taylor & Francis

R2 G.N.Tiwari, Solar Energy – Fundamentals, Design, Modelling and Applications –Narosa Publication Ltd.,2000.

R3 Ashok V Desai, Non-Conventional Energy- Wiley Eastern, 2000.

Part-B

COURSE DELIVERY PLAN (LESSON PLAN): Section-A

UNIT-I : GLOBAL AND NATIONAL ENERGY SCENARIO & SOLAR ENERGY HARNESSING DEVICES

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.	Course Outcomes & Blooms Taxonomy Levels	2	05.07.23 06.07.23		**TLM1/ TLM2**			
2.	Over view of conventional & renewable energy sources	2	07.07.23 12.07.23		**TLM1/ TLM2**	CO1	T1	
3.	Need & Development of renewable energy sources	2	13.07.23 14.07.23		**TLM1/ TLM2**	CO1	T1	
4.	Types of renewable energy systems.	2	15.07.23 19.07.23		**TLM1/ TLM2**	CO1	T1	
5.	Energy available from Sun, Solar radiation data,	1	20.07.23		**TLM1/ TLM2**	CO1	T1	
6.	Flat plate and Concentrating collectors	1	21.07.23		**TLM1/ TLM2**	CO1	T1	
7.	Mathematical analysis of Flat plate collectors and collector efficiency	2	22.07.23 26.07.23		**TLM1/ TLM2**	CO1	T1	
8.	Solar water Heating, Space Heating – Active and Passive heating	1	27.07.23		**TLM1/ TLM2**	CO1	T1	
9.	solar stills and ponds	1	28.07.23		**TLM1/ TLM2**	CO1	T1	
10.	basic principle of power generation in photovoltaic cell	1	02.08.23		**TLM1/ TLM2**	CO1	T1	
11.	Problems	1	03.08.23		**TLM1/ TLM2**	CO1	T1	

12.	**Quiz/Assignment**							
No. of classes required to complete UNIT-I		16			No. of classes taken:			

UNIT-II : Z-WIND ENERGY & GEOTHERMAL ENERGY

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.	Wind – characteristics – wind energy conversion systems – types	2	04.08.23 05.08.23		**TLM1/ TLM2**	CO2	T1	
14.	Betz model & Interference factor, Power Coefficient Torque Coefficient and thrust coefficient	2	09.08.23 10.08.23		**TLM1/ TLM2**	CO2	T1	
15.	site selection requirements.	1	11.08.23		**TLM1/ TLM2**	CO2	T1	
16.	GEOTHERMAL ENERGY: Structure of Earth, Geothermal sources	1	16.08.23		**TLM1/ TLM2**	CO2	T1	
17.	Hot springs, Hot Rocks& Hot Aquifers	1	17.08.23		**TLM1/ TLM2**	CO2	T1	
18.	Interconnection of geothermal fossil systems	1	18.08.23		**TLM1/ TLM2**	CO2	T1	
19.	Problems	1	19.08.23		**TLM1/ TLM2**	CO1	T1	
20.	**Quiz/Assignment**							
No. of classes required to complete UNIT-II		09			No. of classes taken:			

UNIT-III : TIDAL ENERGY, WAVE ENERGY and OCEAN THERMAL ENERGY

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
21.	**Tidal Energy**- Introduction, Origin of Tides, Tidal Power generation	2	23.08.23 24.08.23		**TLM1/ TLM2**	CO3	T1, R8	
22.	Classification of Tidal Power Plant,	1	25.08.23		**TLM1/ TLM2**	CO3	T1	

23.	Site requirements	1	26.08.23		**TLM1/ TLM2**	CO3	T1	
24.	**WAVE ENERGY**: Introduction, Wave energy and Power	2	07.09.23 08.09.23		**TLM1/ TLM2**	CO3	T1	
25.	Wave Energy devices – Merits and Demerits	1	13.09.23 14.09.23		**TLM1/ TLM2**	CO3	T1	
26.	**OCEAN THERMAL ENERGY**: Introduction	1	15.09.23		**TLM1/ TLM2**	CO3	T1	
27.	Working principle of Ocean Thermal Energy Conversion	1	16.09.23		**TLM1/ TLM2**	CO3	T1	
28.	OTEC Systems, Advantages and Disadvantages of OTEC plants.	2	20.09.23 21.09.23		**TLM1/ TLM2**	CO3	T1	
29.	**Quiz/Assignment**					CO3		
No. of classes required to complete UNIT-III		11			No. of classes taken:			

UNIT-IV : BIO – ENERGY

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
30.	**BIO – ENERGY**: Introduction	1	22.09.23		**TLM1/ TLM2**	CO4	T1	
31.	Biomass Energy Sources	1	23.09.23		**TLM1/ TLM2**	CO4	T1	
32.	Aerobic and Anaerobic bio-conversion processes	1	27.09.23		**TLM1/ TLM2**	CO4	T1	
33.	Types of Biogas plants	2	29.09.23 30.09.23					
34.	Raw Materials and properties of Bio-gas	1	04.10.23		**TLM1/ TLM2**	CO4	T1	
35.	Bio-gas plant Technology and Status	1	05.10.23		**TLM1/ TLM2**	CO4	T1	
36.	Biomass gasification	1	06.10.23		**TLM1/ TLM2**	CO4	T1	
37.	Types and application of gasifier	2	07.10.23 11.10.23		**TLM1/ TLM2**	CO4	T1	
38.	**Quiz/Assignment**					CO4		
No. of classes required to complete UNIT-IV		10			No. of classes taken:			

UNIT-V : DIRECT ENERGY CONVERSION SYSTEMS

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
39.	DIRECT ENERGY CONVERSION SYSTEMS: Introduction	1	12.10.23		**TLM1/ TLM2**	CO5	T1	
40.	Peltier effect, seebeck effect, Thomson effect,	1	13.10.23		**TLM1/ TLM2**	CO5	T1	
41.	Fuel Cells-Types.	1	18.10.23		**TLM1/ TLM2**	CO5	T1	
42.	Efficiency of Fuel Cells.	1	19.10.23		**TLM1/ TLM2**	CO5	T1	
43.	Thermoelectric power Generation	1	20.10.23		**TLM1/ TLM2**	CO5	T1	
44.	Thermionic electro power Generation	1	21.10.23					
45.	MHD Generator	1	25.10.23		**TLM1/ TLM2**	CO5	T1	
46.	Open and closed systems	2	26.10.23 27.10.23		**TLM1/ TLM2**	CO5	T1	
47.	applications of direct energy energy conversion systems	1	28.10.23		**TLM1/ TLM2**	CO5	T1	
48.	**Quiz/Assignment**					CO5		
No. of classes required to complete UNIT-V		10			No. of classes taken:			

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

Academic Calender-A.Y-2023-24

Description	From	To	Weeks
B Tech V Semester			
Commencement of class work	03.07.2023		
I phase of Instructions	03.07.2023	26.08.2023	8
I Mid Examination	**28.08.2023**	**02.09.2023**	**1**
II phase of Instructions	04.09.2023	28.10.2023	8

II Mid Examination	**30.10.2023**	**04.11.2023**	**1**
Preparation and Practical	06.11.2023	11.11.2023	1
Semester End Examination	**13.11.2023**	**25.11.2023**	**2**

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: To build a professional career and pursue higher studies with sound knowledge in Mathematics, Science and Mechanical Engineering.

PEO2: To inculcate strong ethical values and leadership qualities for graduates to become successful in multidisciplinary activities.

PEO3: To develop inquisitiveness towards good communication and lifelong learning.

PROGRAMME OUTCOMES (POs)

Engineering Graduates will be able to:

1. Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

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.

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.

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 diverse teams, and in multidisciplinary settings.
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.
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.

PSOs

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

Course Instructor	Course Coordinator	Module Coordinator	HOD
Mr. K Lakshmi Prasad	Mr. K Lakshmi Prasad	Dr. P. Vijay Kumar	Dr. S. Pichi Reddy

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DEPARTMENT OF COMPUTER SCIENCE &ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : R. Ashok
Course Name & Code : **COMPUTER NETWORKS LAB**&20CS60
L-T-P Structure : 0-0-3 Credits: 1.5
Program/Sem/Sec : B.Tech. CSE., V-Sem., Section-**AI&ML** **A.Y: 2023-24**

PRE-REQUISITES: Data Structures and Operating Systems

COURSE EDUCATIONAL OBJECTIVES (CEOs): The main objective of this course is to prepare students to write programs to illustrate communication in networks configure different networks (LAN, WAN) and prepare students to differentiate various protocols and their performance.

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

CO 1	Implement Network layer functionalities using NS3 simulator
CO 2	Demonstrate Transport Layer functionalities
CO 3	Analyze Application layer protocols using Wireshark
CO 4	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	3	3	-	-	-	-	-	-	-	1	-	-	-
CO2	1	2	3	3	-	-	-	-	-	-	-	1	-	-	-
CO3	1	2	3	3	-	-	-	-	-	-	-	1	-	-	-
CO4	-	-	-	-	-	-	-	1	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).

PART-B

COURSE DELIVERY PLAN (LESSON PLAN): Section - A

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	HOD Sign
1.	Introduction	3	07-07-2023		
2.	Basic network commands & utilities	3	14-07-2023		
3.	Network layer tools and analyzecaptures for congestion	3	21-07-2023		
4.	Network layer tools and analyzecaptures for congestion	3	28-07-2023		
5.	Queue management techniques and global routing in NS3	3	04-08-2023		
6.	Broadcasting, multicasting and bridging in LAN using ns3	3	11-08-2023		
7.	Learn about Wifi and mobile Adhoc topologies with NS3	3	18-08-2022		
8.	Socket programming in TCP andUDP	3	25-08-2023		
9.	Observation of TCP Connection states, Flags and Flow control	3	08-09-2023		
10.	TCP Flow control, Error controland Congestion	3	15-09-2023		
11.	Wireshark& tcpdump, observation of packets in a LAN	3	22-09-2023		
12.	Analyze HTTP packets using Wireshark tool and understand records returned by DNS Server.	6	29-09-2023 06-10-2023		
13.	Practice	3	13-10-2023		
14.	Practice	3	20-10-2023		
15.	Lab Internal Exam		27-10-2023		

PART-C EVALUATION PROCESS (R20 Regulations):

Evaluation Task	**Marks**
Day-to-day work	A1 = 05
Record	A2 = 05
Internal test	A3 = 05
CIE Total: (A1+A2+A3)	**M1 = 15**
Procedure/Algorithm	B1 = 5
Experimentation/Program execution	B2 = 10
Observations/Calculations/Validation	B3 = 10
Result/Inference	B4 = 5
Viva voce	B5 = 5
SEE Total: (B1+B2+B3+B4+B5)	**M2 = 35**
Total Marks = CIE + SEE = (M1+M2)	**50**

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 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	Programming Paradigms: To inculcate algorithmic thinking, formulation techniques and visualization, leading to problem solving skills using different programming paradigms. 2. Data Engineering: To inculcate an ability to Analyze, Design and implement data driven applications into the students. 3. Software Engineering: Develop an ability to implement various processes / methodologies /practices employed in design, validation, testing and maintenance of software products.
PSO 2	Data Engineering: To inculcate an ability to Analyze, Design and implement data driven applications into the students.
PSO 3	Software Engineering: Develop an ability to implement various processes / methodologies /practices employed in design, validation, testing and maintenance of software products.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Mr. R. Ashok	Dr. K. Naga Prasanthi	Dr. D. Venkata Subbaiah	Dr. D. Veeraiah

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DEPARTMENT OF COMPUTER SCIENCE &ENGINEERING

PART-A

Name of Course Instructor: Dr. K DEVI PRIYA

Course Name & Code :- Machine learning Lab-20AD53
L-T-P Structure :0-0-2 **Credits**:1.5
Program/Sem/Sec : B.Tech. – CSE(AI&ML) V/A
A.Y.:2023-24

PREREQUISITE:Knowledge of basic Computer hardware & software.

COURSE EDUCATIONAL OBJECTIVES (CEOs):

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

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

CO1	Apply the appropriate pre-processing techniques on data set. (**Apply – L3**)
CO2	Implement supervised Machine Learning algorithms. (**Apply – L3)**
CO3	Implement unsupervised Machine Learning algorithms (**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	-	2	-	2	3	-	-	-	-	-	-	-	-	-	-
CO2	-	2	-	2	3	-	-	-	-	-	-	2	-	-	-
CO3	2	2	-	-	3	-	-	-	-	-	-	2	-	2	-
CO4	-	-	-	-	-	-	-	-	-	2	-	2	-	2	-
1 - Low						**2 –**Medium						**3 -** High			

COURSE DELIVERY PLAN (LESSON PLAN):

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Lab Cycle-1	3	5-07-2023		**DM5**	
2.	Lab Cycle-1	3	12-07-2023		**DM5**	
3.	Lab Cycle -2	3	19-08-2023		**DM5**	
4.	Lab Cycle-2	3	26-08-2023		**DM5**	
5.	Lab Cycle-2	3	9-08-2023		**DM5**	
6.	Lab Cycle-3	3	16-08-2023		**DM5**	

7.	Lab Cycle-3	3	23-8-2023		**DM5**	
8.	Lab Cycle-4	3	13-09-2023		**DM5**	
9.	Lab Cycle-4	3	20-09-2023		**DM5**	
10.	Lab Cycle5	3	27-09-2023		**DM5**	
11.	Lab Cycle6	3	4-10-2023		**DM5**	
12.	Lab Cycle 6	3	11-10-2023		**DM5**	
13.	Lab Cycle7	3	18-11-2023		**DM5**	
14.	Lab Cycle-8	3	16-11-2023		**DM5**	
15.	Internal exam	3	25-10-2023			

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

EVALUATION PROCESS (R20 Regulations):

Evaluation Task	**Marks**
Day-to-day work	A1 = 05
Record	A2 = 05
Internal test	A3 = 05
CIE Total: (A1+A2+A3)	**M1 = 15**
Procedure/Algorithm	B1 = 5
Experimentation/Program execution	B2 = 10
Observations/Calculations/Validation	B3 = 10
Result/Inference	B4 = 5
Viva voce	B5 = 5
SEE Total: (B1+B2+B3+B4+B5)	**M2 = 35**
Total Marks = CIE + SEE = (M1+M2)	**50**

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
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	(Dr. K DeviPriya)	(Dr. K DeviPriya)	(Dr.Y V Bhaskar Reddy)	(Dr. D. Veeraiah)
Signature				

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DEPARTMENT OF COMPUTER SCIENCE &ENGINEERING(CSM)

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr.Y.Vijay Bhaskar Reddy
Course Name & Code **:**Mean Stack Technologies -20CSS3
L-T-P Structure **:**1-0-3 **Credits:**2
Program/Sem/Sec : B.Tech. – AI&ML **A.Y.:**2023-24

PREREQUISITE:Full Stack Development

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

CO1	Develop professional web pages of an application using HTML elements like lists, navigations, tables, various form elements, embedded media which includes images, audio, video and CSS Styles **(Apply-L3)**
CO2	Build a basic web server using Node.js , Exress.js and also working with Node Package Manager (NPM) **(Apply-L3)**
CO3	Make use of Typescript to optimize JavaScript code by using the concept of strict type checking. **(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	-	3	-
CO2	1	-	2	-	2	-	-	-	-	-	-	2	-	3	-
CO3	1	-	2	-	2	-	-	-	-	-	-	2	-	3	-
CO4	-	-	-	-	-	-	-	2	2	2	-	-	-	-	-
1 - Low **2 –**Medium **3 -** High															

Text Books&REFERENCE BOOKS:

T1	Programming the World Wide Web, 7th Edition, Robet W Sebesta, Pearson
T2	Pro Mean Stack Development, 1st Edition, ELadElrom, Apress O'Reilly.
T3	Budi Kurniawan, "Struts 2 Design and Programming: A Tutorial", BrainySoftware, 2nd Edition, 2008.
R1	Web Technologies, HTML, JavaScript, PHP, Java, JSP, XML and AJAX, Black book, 1st Edition, Dream Tech.
R2	An Introduction to Web Design, Programming, 1st Edition, Paul S Wang, Sanda S Katila, Cengage Learning.

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.	Cycle-1(HTML)	4	03-07-2023		**DM5/ DM6**	
2.	Cycle -2(HTML)	4	10-07-2023		**DM5/ DM6**	
3.	Cycle-3(JS)	4	17-07-2023		**DM5/ DM6**	
4.	Cycle-4(JS)	4	24-07-2023		**DM5/ DM6**	
5.	Cycle-5(JS)	4	31-07-2023		**DM5/ DM6**	
6.	Cycle-6(Node.JS)	4	07-08-2023		**DM5/ DM6**	
7.	Cycle-6(Node.JS)	4	14-08-2023		**DM5/ DM6**	
8.	Cycle-7(Express.js)	4	21-08-2023		**DM5/ DM6**	
9.	Cycle-8(Express.js)	4	04-09-2023		**DM5/ DM6**	
10.	Cycle-9 (Typescript)	4	11-09-2023		**DM4DM5/ DM6**	
11.	Cycle-10 (Typescript)	4	18-09-2023		**DM5/ DM6**	
12.	Cycle-11 (Typescript)	4	25-09-2023		**DM5/ DM6**	
13.	Cycle-12 (Typescript)	4	02-10-2023		**DM5/ DM6**	
14.	Cycle-12 (Typescript)	4	09-10-2023		**DM4/DM5/ DM6**	
15.	Assessment	4	16-10-2023		**DM4/DM5/ DM6**	

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

EVALUATION PROCESS (R20 Regulation):

Evaluation Task	**Marks**
Report	10
Quality of work	10
Presentation	20
Interaction / Queries	10
Total	50

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
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	((Dr. Y.V. Bhaskar Reddy)	Dr. Y.V. Bhaskar Reddy	Dr. Y.V. Bhaskar Reddy	(Dr. D. Veeraiah)
Signature				