LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING, (AUTONOMOUS)
Accredited by NAAC with 'A' Grade & NBA (Under Tier - I),
ISO 21001 : 2018, 50001 : 2018, 14001: 2015 Certified Institution
Approved by AICTE, New Delhi. and Affiliated to JNTUK, Kakinada
L.B. REDDY NAGAR, MYLAVARAM, NTR DIST., A.P.-521 230.
Phone: 08659-222933, Fax: 08659-222931

FRESHMAN ENGINEERING DEPARTMENT
COURSE HANDOUT
PART-A

Name of Course Instructor: D.Chaithanya
Course Name & Code   : Communicative English & 23FE50
L-T-P Structure   **: 2-0-0**   **Credits:** 02
Program/Sem/Sec   : B. Tech, I Sem –AIDS -A
A.Y.   **:** 2023-24

PREREQUISITE: NIL

COURSE EDUCATIONAL OBJECTIVES (CEOs):

The main objective of introducing this course, *Communicative English,* is to facilitate effective

Listening, Reading, Speaking and Writing skills among the students. It enhances the same in their

comprehending abilities, oral presentations, reporting useful information and providing knowledge

of grammatical structures and vocabulary. This course helps the students to make them effective in

speaking and writing skills and to make them industry ready.

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

CO1	Understand the context, topic, and pieces of specific information from social or Transactional dialogues.	L2
CO2	Apply grammatical structures to formulate sentences and correct word forms.	L3
CO3	Use discourse markers to speak clearly on a specific topic in informal discussions.	L3
CO4	Read / Listen the texts and write summaries based on global comprehension of these texts.	L2
CO5	Prepare a coherent paragraph, essay, and resume.	L3

COURSE ARTICULATION MATRIX (Correlation between COs & POs)

Course Outcomes	Programme Outcomes											
PO's →	1	2	3	4	5	6	7	8	9	10	11	12
CO1.	-	-	-	1	-	-	-	-	3	3	-	2
CO2.	-	-	-	1	-	-	-	-	3	3	-	2
CO3.	-	-	-	1	-	-	-	-	3	3	-	2
CO4.	-	-	-	1	-	-	-	-	3	3	-	2
CO5.	-	-	-	1	-	-	-	-	3	3	-	2

1 = Slight (Low)   2= Moderate (Medium)   3 = Substantial (High)

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	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Bridge Course				TLM1			
2.	Introduction to the course	3 Weeks	31-08-2023 TO 16-09-2023		TLM1			
3.	Course Outcomes, Program Outcomes				TLM2			

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.	**Human Values: Gift of Magi**	02	20/9/2023 21/9/2023		TLM1 TLM 6	CO1	T1,T2	
2.	**Skimming to get main idea; Scanning for specific pieces of information**	01	25/9/2023		TLM2 TLM5	CO1	T1,T2	
3.	**Mechanics of Writing: Capitalization, Spelling, Punctuation & Parts of Sentences**	01	27/9/2023		TLM1 TLM6 TLM5	CO1	T1,T2	
4.	**Parts of speech**	02	4/10/2023 5/10/2023		TLM2 TLM6	CO1	T1,T2	
5.	**Basic Sentence Structures, Forming questions**	01	9/10/2023		TLM2 TLM6	CO1	T1,T2	
6.	**Synonyms, Antonyms ,Affixes, Root Words**	01	11/10/2023		TLM2 TLM5	CO1	T1,T2	
No. of classes required to complete UNIT-I: 08						**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
7.	**Nature: The Brook by Alfred Tennyson**	02	12/10/2023 16/10/2023		TLM1 TLM 6	CO22	T1,T2	
8.	**Identifying Sequence of ideas, Linking ideas into a Paragraph**	01	18/10/2023		TLM2 TLM5	CO2	T1,T2	
9.	**Structure of Paragraph – Paragraph Writing**	01	19/10/2023		TLM1 TLM6 TLM5	CO2	T1,T2	
10.	**Cohesive Devices- linkers, Homophones, Homographs, Homonyms**	01	25/10/2023		TLM2 TLM6	CO2	T1,T2	
11.	**Use of Articles and zero article, Prepositions**	02	26/10/2023 30/10/2023		TLM2 TLM6	CO2	T1,T2	
No. of classes required to complete UNIT-II: 07						**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	Learning Outcome COs	Text Book followed	HOD Sign Weekly
12.	**Biography: Elon Musk**	02	1/11/2023 2/11/2023		TLM1 TLM 6	CO3	T1,T2	
13.	**Reading and making basic inferences – recognizing and interpreting the text clues for comprehension**	01	13/11/2023		TLM2 TLM5	CO3	T1,T2	
14.	**Summarizing, Note-making, Paraphrasing**	02	15/11/2023 16/11/2023		TLM1 TLM6 TLM5	CO3	T1,T2	
15.	**Verbs- Tenses, Subject-verb agreement**	03	20/11/2023 22/11/2023 23/11/2023		TLM2 TLM6	CO3	T1,T2	
16.	**Compound words, Collocations**	01	27/11/2023		TLM2 TLM5	CO3	T1,T2	
No. of classes required to complete UNIT-III: 09						**No. of classes taken:**		

UNIT-IV:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
17.	**Inspiration: The Toys of Peace- by Saki**	02	29/11/2023 30/11/2023		TLM1 TLM 6	CO4	T1,T2	
18.	**Study of graphic elements in text to display complicated data**	01	4/12/2023		TLM2 TLM5	CO4	T1,T2	
19.	**Letter Writing : Official Letters, Resumes**	02	6/12/2023 7/12/2023		TLM1 TLM6 TLM5	CO4	T1,T2	
20.	**Reporting verbs, Direct & Indirect Speech, Active & Passive voice**	02	11/12/2023 13/12/2023		TLM2 TLM6	CO4	T1,T2	
21.	**Words often confused, Jargons**	01	14/12/2023		TLM2 TLM5	CO4	T1,T2	
No. of classes required to complete UNIT-IV: 08						**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	Learning Outcome COs	Text Book followed	HOD Sign Weekly
22.	**Motivation: The Power of Interpersonal Communication**	02	18/12/2023 20/12/2023		TLM1 TLM 6	CO5	T1,T2	
23.	**Reading Comprehension**	01	21/12/2023		TLM2 TLM5	CO5	T1,T2	
24.	**Structured Essays on specific topics**	01	27/12/2023		TLM1 TLM6 TLM5	CO5	T1,T2	
25.	**Editing Texts – Correcting Common errors Technical**	02	28/12/2023		TLM2 TLM6	CO5	T1,T2	

	Jargon,						
No. of classes required to complete UNIT-V: 06						**No. of classes taken:**	

S. No.	Topics to be covered beyond the syllabus	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Word Analogy	01	30-12-2023		TLM2 &5	
2.					TLM2 &5	
3.					TLM2 &5	
No. of classes required to complete UNIT-V: 07						

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 (R23 Regulation):

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

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.

At the top of the page (continuation of PO 7):

societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	Possesses necessary skill set to analyze and design various systems using analytical and software tools related to civil engineering.
PSO 2	Possesses ability to plan, examine and analyse the various laboratory tests required for the professional demands.
PSO 3	Possesses basic technical skills to pursue higher studies and professional practice in civil engineering domain.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	D.Chaithanya	Dr.R.Padma	Dr. R.Padma	Dr. A. Ramireddy
Signature				

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr.S,VijayaDasaradha
Course Name & Code : Chemistry&23FE02
L-T-P Structure :3-0-0   **Credits:03**
Program/Sem/Sec : B.Tech/I-Sem/AI&DS-A   **A.Y. :**2023-24

PREREQUISITE: Nil

COURSE EDUCATIONAL OBJECTIVES (CEOs):
- To enable the students to understand the fundamental concepts of chemistry and to provide them with the knowledge of industrial problems and finding the solutions.
- To strengthen the basic concepts of bonding models, advanced engineering materials, electrochemistry, batteries and polymers.
- To introduce instrumental methods and their applications.

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

CO1	Understand the fundamentals of quantum mechanics and molecular orbital energydiagrams for molecules(Understand)
CO2	Summarize the suitability of advanced materials like semiconductors,superconductors, super capacitors and nano materials, in advanced fields(Understand)
CO3	Apply Nernst equation in calculating cell potentials and understand conductometric,potentiometric titrations, electrochemical sensors and compare batteries for differentapplications(Understand)
CO4	Outline the importance of polymers and conducting polymers in advancedtechnologies(Understand)
CO5	Understand the fundamentals of UV-Visible, IR spectroscopic techniques and basicprinciples of chromatographic techniques(Understand)

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

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	-	-	-	-	-	-	-	-	-	-	1
CO2	3	2	2	2	-	2	2	-	-	-	-	2
CO3	3	3	2	2	-	2	2	-	-	-	-	2
CO4	3	2	2	2	-	2	2	-	-	-	-	2
CO5	3	2	1	1	-	-	-	-	-	-	-	1
1 = Slight (Low)			**2 = Moderate (Medium)**				**3 = Substantial (High)**					

Textbooks:
1. Jain and Jain, Engineering Chemistry, 16/e, DhanpatRai, 2013.
2. Peter Atkins, Julio de Paula and James Keeler, Atkins' Physical Chemistry, 10/e, Oxford University Press, 2010.

Reference: Books:
1. Skoog and West, Principles of Instrumental Analysis, 6/e, Thomson, 2007.
2. J.D. Lee, Concise Inorganic Chemistry, 5th Edition, Wiley Publications, Feb.2008
3. Textbook of Polymer Science, Fred W. Billmayer Jr, 3rd Edition

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: STRUCTURE AND BONDING

MODELS

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.		1	20-09-2023		TLM1	
2.		1	21-09-2023		TLM1	
3.	Bridge Course	1	22-09-2023		TLM1	
4.		1	25-09-2023		TLM1	
5.	Fundamentals Of Quantum Mechanics	1	27-09-2023		TLM1	
6.	Schrodinger Wave Equation	1	29-09-2023		TLM1	
7.	Significance of Ψ and Ψ^2	1	04-10-2023		TLM1	
8.	Particle In one dimensional box	1	05-10-2023		TLM2	
9.	Molecular Orbital Theory – Bonding in Homo- and Heteronuclear Diatomic Molecules	1	06-10-2023		TLM1	
10.	Energy level diagrams of O_2 and CO	1	09-10-2023		TLM1	
11.	π-molecular orbitals of butadiene	1	11-10-2023		TLM2	
12.	π-molecular orbitals ofbenzene	1	12-10-2023		TLM1	
13.	Calculation of Bondorder	1	13-10-2023		TLM1	
14.	Practice of Molecular orbital diagrams	1	16-10-2023		TLM1	
No. of classes required to complete UNIT-I: 14				No. of classes taken:		

UNIT-II: MODERN ENGINEERING MATERIALS

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.	Semiconductors - Introduction	1	18-10-2023		TLM1	
2.	Semiconductors - Basic concept&applications	1	19-10-2023		TLM1	
3.	Super conductors - Introduction	1	25-10-2023		TLM2	
4.	Super conductors - Basic concept&applications	1	26-10-2023		TLM1	
5.	Supercapacitors - Introduction	1	27-10-2023		TLM1	
6.	Supercapacitors - Basic concept-classification&applicatio ns	1	30-10-2023&01-11-23		TLM1	
7.	Nano materials - Introduction	1	02-11-2023		TLM2	
8.	Nano materials - classification	1	03-11-2023		TLM2	
9.	Nano materials - properties and applications of fullerenes	1	06-11-2023&08-11-23		TLM2	
10.	Nano materials - carbon nano tubes and graphine nanoparticles	1	09-11-2023&10-11-23		TLM2	
No. of classes required to complete UNIT-II: 13				No. of classes taken:		

UNIT-III: ELECTROCHEMISTRY AND APPLICATIONS

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.	Electrochemical cell, Nernst equation	1	20-11-2023		TLM1	
2.	Cell potential calculations and numerical problems	1	22-11-2023		TLM1	
3.	Potentiometry-potentiometric titrations (redox titrations)	1	23-11-2023		TLM1	
4.	Concept of conductivity, conductivitycell, conductometric titrations (acid-base titrations)	1	24-11-2023		TLM2	
5.	Electrochemical sensors – potentiometric sensors with examples, amperometric sensors with examples	1	27-11-2023		TLM1	
6.	Primary cells – Zinc-air battery, Secondary cells –	1	29-11-2023&		TLM1	

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
	lithium-ion batteries-working of the batteries including cell reactions		30-11-23			
7.	Fuel cells, hydrogen-oxygenfuel cell– working of the cells	1	01-12-2023		TLM2	
8.	PolymerElectrolyte Membrane Fuel cells (PEMFC)	1	04-12-2023		TLM1	

No. of classes required to complete UNIT-III: 09				No. of classes taken:		

UNIT-IV: POLYMER CHEMISTRY

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 to polymers, functionality of monomers	1	06-12-2023		TLM1	
2.	Chain growth and step growth polymerization, coordination polymerization, with specific examples	1	07-12-2023		TLM1	
3.	Mechanisms of polymer formation	1	08-12-2023		TLM2	
4.	Plastics –Thermo and Thermosetting plastics	1	11-12-2023		TLM1	
5.	Preparation, properties and applications of – PVC, Teflon, Bakelite, Nylon-6,6, carbon fibres	1	13-12-2023& 14-12-2023		TLM1	
6.	Elastomers–Buna-S, Buna-N–preparation, properties and applications	1	15-12-2023& 18-12-2023		TLM2	
7.	Conducting polymers – polyacetylene, polyaniline, – mechanism of conduction and applications	1	20-12-2023		TLM1	
8.	Bio-Degradable polymers - Poly Glycolic Acid (PGA), Polyl Lactic Acid (PLA)	1	21-12-2023& 22-12-23		TLM1	

No. of classes required to complete UNIT-IV: 11				No. of classes taken:		

UNIT-V: INSTRUMENTAL METHODS AND APPLICATIONS

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.	Electromagnetic spectrum	1	27-12-2023		TLM1	
2.	Absorption of radiation: Beer-Lambert's law	1	28-12-2023		TLM1	

S.No.	Topics	No. of Classes	Tentative Date	Actual Date	Teaching Learning Methods	HOD Sign Weekly
3.	UV-Visible Spectroscopy	1	29-12-2023		TLM1	
4.	electronic transition, Instrumentation	1	03-01-2024		TLM1	
5.	IR spectroscopies, fundamental modes	1	04-01-2024		TLM2	
6.	selection rules, Instrumentation	1	05-01-2024		TLM1	
7.	Chromatography-Basic Principle	1	08-01-2024		TLM2	
8.	Classification-HPLC: Principle, Instrumentation and Applications	1	10-01-2024		TLM1	
No. of classes required to complete UNIT-V: 08				No. of classes taken:		

TOPICS 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.	Applications of semiconductors, superconductors and nanomaterials in advanced technologies.	1	11-01-2024&12-01-2024		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)	A1=5
I-Descriptive Examination (Units-I, II)	M1=15
I-Quiz Examination (Units-I, II)	Q1=10
Assignment-II (Unit-III, IV & V)	A2=5
II- Descriptive Examination (UNIT-III, IV & V)	M2=15
II-Quiz Examination (UNIT-III, 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 engineeringproblems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineeringproblemsreachingsubstantiatedconclusionsusingfirstprinciplesofmathematics 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 appropriateconsiderationforthepublichealthandsafety,andthecultural,societal,andenviron mentalconsiderations.
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 forsustainable 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, beingable to comprehend andwriteeffectivereportsanddesigndocumentation,makeeffectivepresentations,andgivean dreceiveclear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of theengineeringandmanagementprinciplesandapplythesetoone'sownwork,asamemberandle aderinateam, 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.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Mr.S.VijayaDasaradha ha	Dr.V.Parvathi	Dr.V.Parvathi	Dr.A.Rami Reddy
Signature				

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Phone: 08659-222933, Fax: 08659-222931

FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT
Part-A

PROGRAM   **:** I B. Tech., I-Sem., AI & DS A
ACADEMIC YEAR   **:** 2023-24
COURSE NAME & CODE   **:** Linear Algebra & Calculus
L-T-P STRUCTURE   **:** 3-0-0
COURSE CREDITS   **:** 3
COURSE INSTRUCTOR   **:** Dr. D. VIJAY KUMAR
COURSE COORDINATOR   **:** Dr. A. Rami Reddy
PRE-REQUISITES   **:** Basics of Matrices**,** Differentiation, Integration

COURSE EDUCATIONAL OBJECTIVES (CEOs): To equip the students with standard concepts and tools at an intermediate to advanced level mathematics, to develop the confidence and ability among the students to handle various real-world problems and their applications.

COURSE OUTCOMES (COs)

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

CO1: Apply matrix algebra techniques to solve engineering problems – **L3**

CO2: Use Eigen values and Eigen vectors concept to find nature of quadratic form, inverse and powers of matrix – **L3**

CO3: Expand various functions using Mean value theorems – **L2**

CO4: Understand the concepts of functions of several variables which are useful in optimization – **L2**

CO5: Evaluate areas and volumes by using double and triple integrals – **L3**

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

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	-	-	-	-	-	-	-	-	-	1
CO2	3	2	-	-	-	-	-	-	-	-	-	1
CO3	3	1	-	-	-	-	-	-	-	-	-	1
CO4	3	2	-	-	-	-	-	-	-	-	-	1
CO5	3	2	-	-	-	-	-	-	-	-	-	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).

BOS APPROVED TEXT BOOKS:
T1   Dr. B.S. Grewal, "Higher Engineering Mathematics", 44ndEdition, Khanna Publishers, New Delhi, 2017.
T2   Erwin Kreyszig, *"Advanced Engineering Mathematics"*, 10th Edition, John Wiley & sons, New Delhi, 2018.

BOS APPROVED REFERENCE BOOKS:
R1   George B. Thomas, Maurice D. Weir and Joel Hass, *"Thomas Calculus"*, 14th Edition, Pearson Publishers, 2018.
R2   R.K. Jain and S.R.K. Iyengar, *"Advanced Engineering Mathematics"*, 5th Edition (9th reprint), Alpha Science International Ltd., 2021.
R3   Glyn James, *"Advanced Modern Engineering Mathematics"*, 5th Edition, Pearson Publishers, 2018.
R4   Michael D.Greenberg, *"Advanced Engineering Mathematics"*, 9th Edition, Pearson Publishers.
R5   H.K. Das, Er. Rajnish Verma, *"Higher Engineering Mathematics"*, 3rd Edition (Reprint 2021), S. Chand Publications, 2014.

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	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Bridge Course	7	08-09-2023 TO 15-09-2023	08-09-2023 TO 15-09-2023	TLM1			
2.	Introduction to the course	1	18-09-2023		TLM1			
3.	Course Outcomes, Program Outcomes	1	20-09-2023		TLM2			

UNIT-I: Matrices

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
4.	Introduction to Unit I, Matrices	1	21-09-2023		TLM1	CO1	T1,T2	
5.	Rank of a matrix	1	23-09-2023		TLM1	CO1	T1,T2	
6.	Echelon form	1	25-09-2023		TLM1	CO1	T1,T2	
7.	Normal form	1	26-09-2023		TLM1	CO1	T1,T2	
8.	Cauchy-Binet formulae	1	27-09-2023		TLM1	CO1	T1,T2	
9.	Inverse by Gauss-Jordan method	1	29-09-2023		TLM1	CO1	T1,T2	
10.	System of Linear Equations	1	30-09-2023		TLM1	CO1	T1,T2	
11.	Homogeneous System of Equations	1	03-10-2023		TLM1	CO1	T1,T2	
12.	Homogeneous System of Equations	1	04-10-2023		TLM1	CO1	T1,T2	
13.	Non-Homogeneous System of Equations	1	05-10-2023		TLM1	CO1	T1,T2	
14.	Gauss Elimination Method	1	07-10-2023		TLM1	CO1	T1,T2	
15.	Jacobi Iteration Method	1	09-10-2023		TLM1	CO1	T1,T2	
16.	Gauss-Seidel Method	1	10-10-2023		TLM1	CO1	T1,T2	
17.	**TUTORIAL 1**	1	11-10-2023		TLM3	CO1	T1,T2	
No. of classes required to complete UNIT-I		14				No. of classes taken:		

UNIT-II: Eigen Values, Eigen Vectors and Orthogonal Transformations

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
18.	Introduction to Unit II	1	12-10-2023		TLM1	CO2	T1,T2	
19.	Eigen values, Eigen vectors	1	14-10-2023		TLM1	CO2	T1,T2	
20.	Eigen values, Eigen vectors	1	16-10-2023		TLM1	CO2	T1,T2	
21.	Properties	1	17-10-2023		TLM1	CO2	T1,T2	
22.	Cayley-Hamilton Theorem	1	18-10-2023		TLM1	CO2	T1,T2	
23.	Finding Inverse and Powers of matrix	1	19-10-2023		TLM1	CO2	T1,T2	

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
24.	Diagonalization of a matrix	1	25-10-2023		TLM1	CO2	T1,T2	
25.	Quadratic Forms	1	26-10-2023		TLM1	CO2	T1,T2	
26.	Nature of Quadratic Forms	1	28-10-2023		TLM1	CO2	T1,T2	
27.	Reduction of Quadratic form to Canonical form	1	30-10-2023		TLM1	CO2	T1,T2	
28.	Orthogonal Transformation	1	31-10-2023		TLM1	CO2	T1,T2	
29.	Orthogonal Transformation	1	01-11-2023 02 -11- 23		TLM1	CO2	T1,T2	
30.	**TUTORIAL 2**	1	04-11-2023		TLM3	CO2	T1,T2	
No. of classes required to complete UNIT-II		13			No. of classes taken:			

I MID EXAMINATIONS (06-11-2023 TO 11-11-2023)

UNIT-III: Calculus

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
31.	Introduction to Unit III	1	13-11-2023		TLM1	CO3	T1,T2	
32.	Mean Value theorem	1	14-11-2023		TLM1	CO3	T1,T2	
33.	Rolle's theorem	1	15-11-2023		TLM1	CO3	T1,T2	
34.	Lagrange's mean value theorem	1	16-11-2023		TLM1	CO3	T1,T2	
35.	Lagrange's mean value theorem	1	18-11-2023		TLM1	CO3	T1,T2	
36.	Cauchy's mean value theorem	1	20-11-2023		TLM1	CO3	T1,T2	
37.	Cauchy's mean value theorem	1	21-11-2023		TLM1	CO3	T1,T2	
38.	Taylor's theorem	1	22-11-2023		TLM1	CO3	T1,T2	
39.	Maclaurin's theorem	1	23-11-2023		TLM1	CO3	T1,T2	
40.	Problems and applications	1	25-11-2023		TLM1	CO3	T1,T2	
41.	**TUTORIAL 3**	1	27-11-2023		TLM3	CO3	T1,T2	
No. of classes required to complete UNIT-III		11			No. of classes taken:			

UNIT-IV: Partial differentiation and Applications (Multi variable Calculus)

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
42.	Introduction to Unit IV, Functions of several variables.	1	28-11-2023		TLM1	CO4	T1,T2	
43.	Continuity and Differentiability	1	29-11-2023		TLM1	CO4	T1,T2	
44.	Partial Derivatives	1	30-11-2023		TLM1	CO4	T1,T2	
45.	Total derivatives, Chain rule, Directional Derivative	1	02-12-2023		TLM1	CO4	T1,T2	
46.	Taylor's Series expansion	1	04-12-2023		TLM1	CO4	T1,T2	

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
47.	Maclaurin's series expansion	1	05-12-2023		TLM1	CO4	T1,T2	
48.	Jacobian	1	06-12-2023		TLM1	CO4	T1,T2	
49.	Functional Dependence	1	07-12-2023		TLM1	CO4	T1,T2	
50.	Maxima and Minima	1	09-12-2023		TLM1	CO4	T1,T2	
51.	Lagrange Multiplier Method	1	11-12-2023		TLM1	CO4	T1,T2	
52.	**TUTORIAL 4**	1	12-12-2023		TLM3	CO4	T1,T2	
No. of classes required to complete UNIT-IV		11			No. of classes taken:			

UNIT-V: Multiple Integrals (Multi variable Calculus)

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
53.	Introduction to Unit-V	1	13-12-2023		TLM1	CO5	T1,T2	
54.	Double Integrals - Cartesian coordinates	1	14-12-2023		TLM1	CO5	T1,T2	
55.	Double Integrals- Polar co ordinates	1	16-12-2023		TLM1	CO5	T1,T2	
56.	Triple Integrals - Cartesian coordinates	1	18-12-2023		TLM1	CO5	T1,T2	
57.	Triple Integrals - Spherical coordinates	1	19-12-2023		TLM1	CO5	T1,T2	
58.	Change of order of Integration	1	20-12-2023		TLM1	CO5	T1,T2	
59.	Change of order of Integration	1	21-12-2023		TLM1	CO5	T1,T2	
60.	Change of variables	1	22-12-2023		TLM1	CO5	T1,T2	
61.	Finding area by double Integral	1	23-12-2023		TLM1	CO5	T1,T2	
62.	Finding Volume by double and triple Integral	1	26-12-2023 27-12-2023		TLM1	CO5	T1,T2	
63.	**TUTORIAL 5**	1	28-12-2023		TLM3	CO5	T1,T2	
No. of classes required to complete UNIT-V		11			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	Learning Outcome COs	Text Book followed	HOD Sign Weekly
64.	Other applications of double integral	1	30-12-2023		TLM2	CO5	T1,T2	
No. of classes		1			No. of classes taken:			
II MID EXAMINATIONS (01-01-2024 TO 06-01-2024)								

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

PART-C

EVALUATION PROCESS (R20 Regulation):

Evaluation Task	Marks
Assignment-I (Units-I, II)	A1=5
I-Descriptive Examination (Units-I, II)	M1=15
I-Quiz Examination (Units-I, II)	Q1=10
Assignment-II (Unit-III, IV & V)	A2=5
II- Descriptive Examination (UNIT-III, IV & V)	M2=15
II-Quiz Examination (UNIT-III, 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):	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.

Dr. D.VIJAY KUMAR	**Dr. A. RAMI REDDY**	**Dr. A. RAMI REDDY**	**Dr. A. RAMI REDDY**
Course Instructor	Course Coordinator	Module Coordinator	HOD

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

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DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND DATA SCIENCE

COURSE HANDOUT

PART-A

Name of Course Instructor: S.RAMI REDDY
Course Name & Code : BASIC CIVIL AND MECHANICAL ENGINEERING&23CM01
L-T-P Structure : 3-0-0   **Credits:** 3
Program/Sem/Sec : B.Tech/I/A-AIDS   **A.Y.:** 2023-24

COURSE EDUCATIONAL OBJECTIVES (CEOs):

• Get familiarized with the scope and importance of Mechanical Engineering in different sectors and industries.

• Explain different engineering materials and different manufacturing processes.

• Provide an overview of different thermal and mechanical transmission systems and introduce basics of robotics and its applications.

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

CO1	Understand the different manufacturing processes.
CO2	Explain the basics of thermal engineering and its applications.
CO3	Describe the working of different mechanical power transmission systems and power plants.
CO4	Describe the basics of robotics and its applications.

TEXTBOOKS:

T1 Internal Combustion Engines by V.Ganesan, By Tata McGraw Hill publications (India) Pvt. Ltd.

T2 A text book of Theory of Machines by S.S. Rattan, Tata McGraw Hill Publications, (India) Pvt. Ltd. 3. An introduction to Mechanical Engg by Jonathan Wicker and Kemper Lewis, Cengage learning India Pvt. Ltd.

REFERENCE BOOKS:

1. G. Shanmugam and M.S.Palanisamy, Basic Civil and the Mechanical Engineering, Tata McGraw Hill publications (India) Pvt. Ltd

2. Thermal Engineering by Mahesh M Rathore Tata McGraw Hill publications (India) Pvt. Ltd.

3. 3D printing & Additive Manufacturing Technology- L. Jyothish Kumar, Pulak M Pandey, Springer publications 4. Appuu Kuttan KK, Robotics, I.K. International Publishing House Pvt. Ltd. Volume-I

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: INTRODUCTION TO MECHANICAL ENGINEERING &ENGINEERING MATERIALS

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.	Role of Mechanical Engineering in Industries and Society	1	19/09/2023		TLM1	
2.	Technologies in different sectors such as Energy	1	20/09/2023		TLM2	
3.	Technologies in different sectors Manufacturing, Automotive	1	21/09/2023		TLM1	
4.	Technologies in different sectors Aerospace, and Marine	1	22/09/2023		TLM1	
5.	Metals-Ferrous and Non-ferrous	1	25/09/2023		TLM2	
6.	Ceramics	1	26/09/2023		TLM2	
7.	Composite	1	27/09/2023		TLM1	
8.	Smart materials	1	29/09/2023		TLM1	
No. of classes required to complete UNIT-I: 8				**No. of classes taken:**		

UNIT-II: MANUFACTURING PROCESS&THERMAL 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
9.	Principles of Casting, Forming	1	03/10/2023		TLM1	
10.	joining processes, Machining	1	04/10/2023		TLM2	
11.	Introduction to CNC machines	1	05/10/2023		TLM1	
12.	3D printing	1	06/10/2023		TLM1	
13.	Smart manufacturing	1	09/10/2023		TLM2	
14.	Working principle of Boilers, Otto cycle, Diesel cycle	1	10/10/2023		TLM1	
15.	Refrigeration and air-conditioning cycles	1	11/10/2023		TLM1	
16.	IC engines, 2-Stroke and 4-Stroke engines	1	12/10/2023		TLM2	
17.	SI/CI Engines	1	13/10/2023		TLM1	
18.	Components of Electric and Hybrid Vehicles	1	16/10/2023		TLM1	
No. of classes required to complete UNIT-II: 10				**No. of classes taken:**		

UNIT-III: POWERPLANTS,MECHANICAL POWER TRANSMISSION &INTRODUCTION TO ROBOTICS

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
19.	Working principle of Steam powerplant	1	17/10/2023		TLM2	
20.	Working principle of Diesel, Hydro, Nuclear power plants	1	18/10/2023		TLM2	
21.	Belt Drives	1	19/10/2023		TLM1	
22.	Chain, Rope drives	1	25/10/2023		TLM1	
23.	Gear Drives and their applications	1	26/10/2023		TLM1	
24.	Introduction to Robotics	1	27/10/2023		TLM2	
25.	Joints & links	1	30/10/2023		TLM1	
26.	configurations	1	31/10/2023		TLM1	
27.	applications of robotics.	1	01/11/2023		TLM2	
28.	Revision	1	02/11/2023		TLM2	
29.	Revision	1	03/11/2023		TLM1	
30.	Revision	1	04/11/2023		TLM1	
No. of classes required to complete UNIT-III: 12				**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 (R23 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	Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	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 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	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	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	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	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	Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	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	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 multidisciplinaryenvironments.
PO 12	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 apply the principles of thermal sciences to design and develop various thermal systems.
PSO 2	To apply the principles of manufacturing technology, scientific management towards improvement of quality and optimization of engineering systems in the design, analysis and manufacturability of products.
PSO 3	To apply the basic principles of mechanical engineering design or evaluation of performance of various systems relating to transmission of motion and power, conservation of energy and other process equipment.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	S.RAMI REDDY/	Dr.K.MURAHARI/	Dr.B.SUDHEER KUMAR/	Dr.M.B.S.S REDDY/
Signature				

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DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND DATA SCIENCE

COURSE HANDOUT
PART-A

Name of Course Instructor : Mr. Siva Ramakrishna Sani

Course Name & Code : Introduction to Programming (23CS01)

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

Program/Sem/Sec : B.Tech./I/A   A.Y.: 2023-24

PRE-REQUISITE: NIL

COURSE EDUCATIONAL OBJECTIVE (CEO):
- To introduce students to the fundamentals of computer programming.
- To provide hands-on experience with coding and debugging.
- To foster logical thinking and problem-solving skills using programming.
- To familiarize students with programming concepts such as data types, control structures, functions, and arrays.
- To encourage collaborative learning and teamwork in coding projects

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

CO1:	Understand basics of computers, the concept of algorithm and algorithmic thinking.	Understand – Level 2
CO2:	Analyze a problem and develop an algorithm to solve it.	Apply – Level 3
CO3:	Implement various algorithms using the C programming language.	Apply – Level 3
CO4:	Understand more advanced features of C language.	Understand – Level 2
CO5:	Develop problem-solving skills and the ability to debug and optimize the code.	Analyze – Level 4

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

TEXTBOOKS:

T1: The C Programming Language", Brian W. Kernighan and Dennis M. Ritchie, Prentice Hall, 1988dition, 2015

T2: Schaum's Outline of Programming with C, Byron S Gottfried, McGraw-Hill Education, 1996

REFERENCE BOOKS:

R1: Computing fundamentals and C Programming, Balagurusamy, E., McGraw-Hill Education, 2008.

R2: Programming in C, ReemaThareja, Oxford, 2016, 2nd edition

R3: C Programming, A Problem Solving Approach, Forouzan, Gilberg, Prasad, CENGAGE, 3rd edition

R2: Programming in C, ReemaThareja, Oxford, 2016, 2nd edition

R3: C Programming, A Problem Solving Approach, Forouzan, Gilberg, Prasad, CENGAGE, 3rd edition

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT – I: Introduction to Programming and Problem Solving

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.	Discussion of CEO's and CO's	1	21-09-2023		**TLM1**	
2.	History of Computers	1	22-09-2023		**TLM1**	
3.	Basic organization of a computer: ALU, input-output units.	2	22-09-2023 23-09-2023		**TLM1**	
4.	Memory, program counter	1	25-09-2023		**TLM1**	
5.	Introduction to Programming Languages,	1	29-09-2023		**TLM1**	
6.	Basics of a Computer Program-Algorithms	1	29-09-2023		**TLM1**	
7.	Flowcharts (Using Dia Tool), pseudo code.	1	30-09-2023		**TLM1**	
8.	Introduction to Compilation and Execution	1	05-10-2023		**TLM1**	
9.	Primitive Data Types	2	06-10-2023 06-10-2023		**TLM1**	
10.	Variables, and Constants, Basic Input and Output operations	2	07-10-2023 09-10-2023		**TLM1**	
11.	Type Conversion, and Casting	1	12-10-2023		**TLM1**	
12.	**Problem solving techniques:** Algorithmic approach, characteristics of algorithm	1	13-10-2023		**TLM1**	
13.	Problem solving strategies: Top-down approach, Bottom-up approach	1	14-10-2023		**TLM1**	
14	Time and space complexities of algorithms.	1	16-10-2023		**TLM1**	
No. of classes required to complete UNIT – I: 17				**No. of classes taken:**		

UNIT – II: Control Structures

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.	Simple sequential programs Conditional Statements	1	19-10-2023		**TLM1**	
16.	if, if-else	1	26-10-2023		**TLM1**	
17.	switch	2	27-10-2023 27-10-2023		**TLM1**	
18.	Example programs on Decision Making and Branching	2	28-10-2023 30-10-2023		**TLM1**	
19.	Loops: while , Example programs	2	02-11-2023 03-11-2023		**TLM1**	
20.	do-while, Example programs	2	03-11-2023 04-11-2023		**TLM1**	
21.	for, Example programs	1	06-11-2023		**TLM1**	
22.	Break and Continue	1	09-11-2023		**TLM1**	
23.	Example programs on Loops	1	10-11-2023		**TLM1**	
24.	Revision	1	10-11-2023		**TLM1**	
No. of classes required to complete UNIT – II: 14				**No. of classes taken:**		

UNIT – III: Arrays and Strings

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
25.	Arrays Introduction, Declaration	1	20-11-2023		TLM1	
26.	Array indexing, Accessing elements	1	23-11-2023		TLM1	
27.	memory model	1	24-11-2023		TLM1	
28.	programs with array of integers	1	24-11-2023		TLM1	
29.	Introduction to two dimensional arrays	1	25-11-2023		TLM1	
30.	2D Array indexing, Accessing elements	1	27-11-2023		TLM1	
31.	programs with 2D arrays	1	30-11-2023		TLM1	
32.	Introduction to Strings	1	01-12-2023		TLM1	
33.	Reading and Writing Operations on Strings	1	01-12-2023		TLM1	
34.	String Handling Functions	1	02-12-2023		TLM1	
35.	Example Programs using Strings	1	04-12-2023		TLM1	
No. of classes required to complete UNIT – III: 11				**No. of classes taken:**		

UNIT – IV: Pointers & User Defined Data types

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
36.	Introduction to Pointers	1	07-12-2023		TLM1	
37.	dereferencing and address operators	1	08-12-2023		TLM1	
38.	pointer and address arithmetic	1	08-12-2023		TLM1	
39.	array manipulation using pointers	2	09-12-2023 / 11-12-2023		TLM1	
40.	User-defined data types	1	14-12-2023		TLM1	
41.	Structures , Definition and Initialization	2	15-12-2023 / 15-12-2023		TLM1	
42.	Example programs	1	16-12-2023		TLM1	
43.	Unions	2	18-12-2023 / 21-12-2023		TLM1	
44.	Example programs	1	22-12-2023		TLM1	
45.	Revision	1	22-12-2023		TLM1	
No. of classes required to complete UNIT – IV: 13				**No. of classes taken:**		

UNIT – V:Functions & File Handling

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
46.	Introduction to Functions	1	23-12-2023		TLM1	
47.	Function Declaration and Definition	1	28-12-2023		TLM1	
48.	Function call Return Types	1	29-12-2023		TLM1	
49.	Arguments	1	29-12-2023		TLM1	
50.	modifying parameters inside functions using pointers	2	30-12-2023 / 04-01-2024		TLM1	
51.	arrays as parameters	1	05-01-2024		TLM1	
52.	Scope and Lifetime of Variables	1	05-01-2024		TLM1	
53.	Introduction to Files	1	06-01-2024		TLM1	

54.	Basics of File Handling	1	08-01-2024		**TLM1**	
55.	Operations on Files	1	11-01-2024		**TLM1**	
No. of classes required to complete UNIT – V: 11				**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
56.	Application Development using C	1	12-01-2024		**TLM1**	
57.	Introduction to Data Structures	1	13-01-2024		**TLM1**	

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

PART-C

EVALUATION PROCESS (R20 Regulation):

Evaluation Task	Marks
Assignment – I (Units-I, II)	A1 = 5
I – Descriptive Examination (Units-I, II)	M1 = 15
I – Quiz Examination (Units-I, II)	Q1 = 10
Assignment – II (Unit-III, IV & V)	A2 = 5
II – Descriptive Examination (UNIT-III, IV & V)	M2 = 15
II – Quiz Examination (UNIT-III, 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):

PO1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineeringproblems.
PO2	**Problem analysis**: Identify, formulate, review research literature, and analyze complexengineering 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 dataand synthesis of the information to provide valid conclusions.
PO5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, andmodern engineering and IT tools including prediction and modelling 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 responsibilitiesrelevant to the professional engineering practice
PO7	**Environment and sustainability**: Understand the impact of the professional engineeringsolutions in societal and environmental contexts, and demonstrate the knowledge of, andneed for sustainable development.
PO8	**Ethics**: Apply ethical principles and commit to professional ethics andresponsibilities andnorms of the engineering practice.
PO9	**Individual and teamwork**: Function effectively as an individual, and as a member orleader in diverse teams, and in multidisciplinary settings.
PO10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO12	**Life-long learning**: Recognize the need for and have the preparation and ability to engaging 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.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	**S. Siva Ramakrishna**	**Dr. B. Srinivasa Rao**	**S. Siva Ramakrishna**	**Dr. O. Rama Devi**
Signature				

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Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF ARTIFICIAL INTELLIGENCE & DATA SCIENCE

COURSE HANDOUT

PART-A

Name of Course Instructor: Ms. P. MADHAVI
Course Name & Code : IT WORKSHOP Lab & 23IT51
L-T-P Structure : 0-0-2   **Credits: 1**
Program/Sem/Sec : B.Tech. – AI&DS/I/A   **A.Y.:** 2023-24
PREREQUISITE : NIL

COURSE EDUCATIONAL OBJECTIVES (CEOs):
   The objective of the course is to impart knowledge about the components of PC, Assembling PC, Installation of OS, software's like MS-Office, LaTex and concepts related to Networking, Internet as well as antivirus.

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

CO1	Identify the components of a PC and Assemble & disassemble the same. (Understand)
CO2	Experiment with installation of Operating System and Secure a computer from Cyber threats.(Apply)
CO3	Develop presentation /documentation using Office tools and LaTeX (Apply)
CO4	Build dialogs and documents using ChatGPT. (Apply)
CO5	Improve individual / teamwork skills, communication and 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	3	-	-	-	-	-	-	-	-	-	-	-	2	-	-
CO2	3	-	-	-	-	-	-	-	-	-	-	-	2	-	-
CO3	3	-	-	-	2	-	-	-	-	-	-	-	2	-	-
CO4	3	-	-	-	-	-	-	-	-	-	-	-	2	-	-
CO5	-	-	-	-	-	-	-	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	Comdex Information Technology course tool kit, Vikas Gupta, WILEY Dream tech, 2003
R2	The Complete Computer upgrade and repair book, Cheryl A Schmidt, WILEY Dream tech,2013, 3rd edition.
R3	Introduction to Information Technology, ITL Education Solutions limited, PearsonEducation,2012, 2nd edition.
R4	PC Hardware - A Handbook, Kate J. Chase, PHI (Microsoft).
R5	LaTeX Companion, Leslie Lamport, PHI/Pearson.
R6	IT Essentials PC Hardware and Software Companion Guide, David An fins on and KenQuamme. –CISCO Press, Pearson Education, 3rd edition.
R7	IT Essentials PC Hardware and Software Labs and Study Guide, Patrick Regan– CISCO Press, Pearson Education, 3rd edition.

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
**PC Hardware & Software Installation**
1.	Task-1	3	23-09-2023		**DM5**	
2.	Task-2	3	30-09-2023		**DM5**	
3.	Task-3	3	07-10-2023		**DM5**	
4.	Task-4	3	14-10-2023		**DM5**	
5.	Task-5	3	14-10-2023		**DM5**	
**Internet & World Wide Web**
6.	Task-1	3	28-10-2023		**DM5**	
7.	Task-2	3	28-10-2023		**DM5**	
8.	Task-3	3	04-11-2023		**DM5**	
9.	Task-4	3	04-11-2023		**DM5**	
**Latex and WORD**
10.	Task-1	3	04-11-2023		**DM5**	
11.	Task-2	3	04-11-2023		**DM5**	
12.	Task-3	3	11-11-2023		**DM5**	
13.	Task-4	3	11-11-2023		**DM5**	
**EXCEL**
14.	Task-1	3	25-11-2023		**DM5**	

15.	Task-2	3	25-11-2023		**DM5**	
	LOOKUP/VLOOKUP					
16.	Task-1	3	02-12-2023		**DM5**	
	POWER POINT					
17.	Task-1	3	06-12-2023		**DM5**	
18.	Task-2	3	23-12-2023		**DM5**	
19.	Task-3	3	23-12-2023		**DM5**	
	AI TOOLS – ChatGPT					
20.	Task-1	3	30-12-2023		**DM5**	
21.	Task-2	3	30-12-2023		**DM5**	
22.	Task-3	3	02-01-2024		**DM5**	
23.	Internal exam	3	02-01-2024		**DM5**	

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 (R23 Regulations): According to Academic Regulations of R23 Distribution and Weightage of Marks for Laboratory Courses is as follows

Continuous Internal Evaluation (CIE): The Continuous Internal Evaluation (CIE) is based on the following parameters:

Parameter	**Marks**
Day to Day work	15
Record	15
Internal Test	
Total	**30**

Semester End Examinations (SEE): The Semester End examinations (SEE) for laboratory courses shall be jointly conducted by internal and external examiners with 3 hours' duration and evaluated for 35 marks. The performance of the student shall be evaluated as per the parameters indicated below:

Parameter	**Marks**
Procedure/Algorithm	20
Experimentation/Program execution	30
Result/Inference	
Viva voce	20
Total	**70**

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	Design and develop modern communication technologies for building the inter disciplinary skills to meet current and future needs of industry.
PSO 2	Design and Analyze Analog and Digital Electronic Circuits or systems and Implement real time applications in the field of VLSI and Embedded Systems using relevant tools.
PSO 3	Apply the Signal processing techniques to synthesize and realize the issues related to real time applications.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Ms.P.Madhavi	Mr.P.Nagababu	Dr. D. Venkata Subbaiah	**Dr. O. Rama Devi**
Signature				

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FRESHMAN ENGINEERING DEPARTMENT
COURSE HANDOUT
PART-A

Name of Course Instructor: D. Chaithanya

Course Name & Code   **:** CE LAB, 23FE51

L-T-P Structure   **: 0-0-2**   **Credits:** 01

Program/Sem/Sec   : B. Tech AIDS -A- I SEM

A.Y.   **:** 2023-24

PREREQUISITE: NIL

COURSE EDUCATIONAL OBJECTIVES (CEOs): The main objective of introducing this course, Communicative English Laboratory, is to expose the students to a variety of self-instructional, learner friendly modes of language learning. The students will get trained in basic communication skills and also make them ready to face job interviews.

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

CO1	Understand the different aspect of the English language proficiency with emphasis on LSRW skills.	L2
CO2	Apply Communication Skills through various language learning activities	L3
CO3	Identifying the English speech sounds, stress, rhythm, intonation and syllable division for better listening and speaking, comprehension.	L2
CO4	Exhibit professionalism in participating in debates and group discussions.	L3

COURSE ARTICULATION MATRIX
(Correlation between COs & POs)

Course Outcomes PO's →	Programme Outcomes											
	1	2	3	4	5	6	7	8	9	10	11	12
CO1.	-	-	-	2	-	-	-	-	3	3	-	2
CO2.	-	-	-	2	-	-	-	-	3	3	-	2
CO3.	-	-	-	2	-	-	-	-	3	3	-	2
CO4.	-	-	-	2	-	-	-	-	3	3	-	2

1 = Slight (Low)   **2= Moderate (Medium)**   **3 = Substantial (High)**

List of Activities:

1.   a. Vowels & Consonants
   b. Neutralization / Accent rules

2. Communication Skills: JAM
3. Conversational Practice: Roleplay
4. e-mail Writing
5. Resume writing, Cover letter, SOP
6. Group Discussions - methods & Practice
7. Debates – Methods and practice
8. PPT Presentations
9. Poster Presentations
10. Interview Skills: Mock Interviews

<u>Note</u>: Any Eight of the listed activates are to be conducted.

Suggested Software:

1.   Walden Infotech
2.   Young India Films

Reference Books:

Raman Meenakshi, Sangeeta-Sharma, *Technical Communication,* Oxford Press 2018.
Taylor Grant: *English Conversation Practice,* Tata McGraw-Hill Education India, 2016.
Hewing's, Martin, Cambridge Academic English (B2), CUP, 2012.
J. Sethi & P.V. Dhamija: *A Course in Phonetics and Spoken English, (*2nd Ed.,*)Kindle, 2013.*

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	HOD Sign Weekly
1.	Introduction to syllabus	03	22/9/2023		TLM4	
2.	Self Introduction & Introducing others	03	29/9/2023		TLM4	
3.	Vowels & Consonants	03	6/10/2023		TLM1, TLM5	
4.	Neutralization / Accent rules	03	13/10/2023		TLM1, TLM5	
5.	JAM-I(Short and Structured Talks)	03	27/10/2023		TLM4	
6.	Role Play-I(Formal and Informal)	03	3/11/2023		TLM4	
7.	e-mail Writing, Resume writing, Cover letter, SOP	03	17/11/2023		TLM1, TLM5	

8.	Group Discussion	03	24/11/2023		TLM4, TLM6
9.	Debate	03	1/12/2023		TLM4, TLM6
10.	PPT & Poster Presentation	03	8/12/2023 15/1/2023		TLM2, TLM4
11.	Mock Interviews	03	22/12/2023		TLM1, TLM6
12.	Lab Internal Exam	03	29/12/2023		
No. of classes required to complete Syllabus: 24				**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

Laboratory Examination:

Evaluation Task	Marks
Day-to-Day Work	A1 = 10
Record & Observation	B1 = 5
Internal Exam	C1 = 15
Cumulative Internal Examination (CIE): (A1+B1+C1)	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in

			societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development
PO 8			**Ethic**s: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9			**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10			**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions
PO 11			**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12			**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	D.chaithanya	Dr. R. Padma	Dr. R. Padma	Dr. A. Ramireddy
Signature				

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Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF FRESHMANENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr.S.VijayaDasaradha
Course Name & Code : Chemistry Lab&23FE52
L-T-P Structure :0-0-3   Credits:1.5
Program/Sem/Sec : B.Tech/I-sem/AI&DS-A   A.Y. :2023-24

Pre requisites: Nil

Course Educational Objective:

- To enable the students to perform different types of volumetric titrations.
- It provides an overview of preparation of polymers, nanomaterials and analytical techniques.

Course Outcomes: After completion of the course, the students will be able to,

CO1: Distinguish different types of titrations in volumetric analysis after performing theexperiments listed in the syllabus. (Analyze)

CO2: Acquire practical knowledge related to preparation of Bakelite and nanomaterials. (Apply)

CO3: Measure the strength of acid present in Pb-Acid battery. (Apply)

CO4: Determine the cell constant and conductance of solutions. (Apply)

CO5: Analyze organic compounds by using UV-Visible and IR spectroscopy. (Apply)

POs\COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	-	-	-	1	2	-	-	-	-	-
CO2	3	-	1	-	-	2	1	-	-	-	-	-
CO3	3	2	1	-	-	-	2	-	-	-	-	-
CO4	3	1	-	-	-	-	-	-	-	-	-	-
CO5	3	2	-	-	2	-	-	-	-	-	-	-
1 = Slight (Low)				**2 = Moderate (Medium)**				**3 = Substantial (High)**			

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 Lab Manual

Part-B

COURSE DELIVERY PLAN (LESSON PLAN): Section-A

S.No.	Experiment	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome Cos	HOD Sign Weekly
1.	*Introduction to Engineeringchemistry lab*	3	*19-09-2023*		*TLM1*		
2.	Preparation of a Bakelite	3	26-09-2023		TLM4	CO1	
3.	*Determination of amount of HCl using standard Na2CO3 solution*	3	*03-10-2023*		*TLM4*	*CO1*	
4.	Determination of Strength of an acid in Pb-Acid battery	3	*10-10-2023*		*TLM4*	CO1	
5.	Estimation of Ferrous Iron by Dichrometry	3	*17-10-2023*		*TLM4*	CO1	
6.	Conductometric titration of strong acid vs. strong base	3	*31-10-2023*		*TLM4*	CO1	
7.	Conductometric titration of weak acid vs. strong base	3	07-11-2023		*TLM4*	CO1	
8.	Potentiometry - determination of redox potentials and emfs	3	*21-11-2023*		*TLM4*	CO1	
9.	Preparation of nanomaterials by precipitation method	3	*28-11-2023*		*TLM4*	CO2	
10.	Verify Lambert-Beer's law	3	*05-12-2023*		*TLM4*	CO4	
11.	Wavelength measurement of sample through UV-Visible Spectroscopy	3	*12-12-2023*		*TLM4*	CO4	
12.	Identification of simple organic compounds by IR	3	*19-12-2023*		*TLM4*	*CO4*	
13.	Revision	3	*26-12-2023*		*TLM4*	*CO4*	
14	*Revision*	3	*02-01-2024*		*TLM4*	*CO4*	
15	*Internal Exam*	3	*09-01-2024*		*TLM4*	*CO4*	
	Total						

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:

According to Academic Regulations of R20 Distribution and Weightage of Marks for Laboratory Courses is as follows.

(a) *Continuous Internal Evaluation(CIE):*

✓ The continuous internal evaluation for laboratory course is based on the following parameters:

Evaluation Task	Marks
Day-to-Day Work	A1 = 10
Record & Observation	B1 = 5
Internal Exam	C1 = 15
Cumulative Internal Examination (CIE): (A1+B1+C1)	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

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 researchmethodsincludingdesignofexperiments,analysisandinterpretationofdata,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.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Mr.S.VijayaDasaradha	Dr.V.Parvathi	Dr.V.Parvathi	Dr.A.Rami Reddy
Signature				

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
(AUTONOMOUS)
Accredited by NAAC with 'A' Grade,
ISO 21001:2018, 50001:2018, 14001:2015 Certified Institution
Approved by AICTE, New Delhi and Affiliated to JNTUK, Kakinada.
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DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND DATA SCIENCE

COURSEHANDOUT
PART-A

Name of Course Instructor   : Siva Ramakrishna Sani

Course Name & Code   : Computer Programming Lab (20CS51)

L-T-P Structure   : 0-0-3   Credits: 1.5

Program/Sem/Sec   : B.Tech./AI&DS/I/A   A.Y. : 2023-24

PRE-REQUISITE: Fundamentals of Mathematics.

COURSE EDUCATIONAL OBJECTIVE (CEO): The course aims to give students hands – on experience and train them on the concepts of the C- programming language.

COURSEOUTCOMES(COs): Attheendofthecourse,thestudentwillbeableto:

CO1:	Read, understand, and trace the execution of programs written in C language. (Understand)	Apply–Level2
CO2:	Select the right control structure for solving the problem. (Apply)	Apply–Level3
CO3:	Develop C programs which utilize memory efficiently using programming constructs like pointers. (Apply)	Apply–Level3
CO4:	Develop, Debug and Execute programs to demonstrate the applications of arrays, functions, basic concepts of pointers in C.(Apply).	Apply–Level3
CO5:	Improve individual / teamwork skills, communication and report writing skills with ethical values.	

COURSEARTICULATIONMATRIX(CorrelationbetweenCOs,POs&PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	-	-	3	-	-	-	-	-	-	-	2	-	-
CO2	3	2	2	-	3	-	-	-	-	-	-	-	2	-	-
CO3	3	2	2	-	3	-	-	-	-	-	-	-	2	-	-
CO4	3	2	2	-	3	-	-	-	-	-	-	-	2	-	-
C05	-	-	-	-	-	-	-	2	2	2	2	2	-	-	-

1 –Low	**2 –Medium**	**3– High**

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

S. No.	Programs to be covered	No. of Classes		Date of Completion	Delivery Method
		Required as per the Schedule	Taken		
1.	Week1: Familiarization with programming environment	03		20-09-2023	DM5
2.	Week2: Problem-solving using Algorithms and Flow charts.	03		27-09-2023	DM5
3.	Week3:Exercise Programs on Variable types and type conversions	03		04-10-2023	DM5
4.	Week4: Exercise Programs on Operators and the precedence and as associativity.	03		11-10-2023	DM5
5.	Week5:Exercise Programs on Branching and logical expressions	03		18-10-2023	DM5
6.	Week6:Exercise Programs on Loops, while and for loops	03		25-10-2023	DM5
7.	Week7: Exercise Programs on 1 D Arrays & searching.	03		01-11-2023	DM5
8.	Week8:ExerciseProgramson2 D arrays, sorting and Strings.	03		08-11-2023	DM5
9.	Week9: Exercise Programs on Pointers, structures and dynamic memory allocation	03		22-11-2023	DM5
10.	Week10:ExerciseProgramson Bit fields, Self-Referential Structures, Linked lists	03		29-11-2023	DM5
11.	Week 11:Exercise Programson Functions, call by value, scope and extent.	03		06-12-2023	DM5
12.	Week 12: Exercise Programs on Recursion, the structure of recursive calls	03		13-12-2023	DM5
13.	Week 13: Exercise Programs on Call by reference, dangling pointers	03		20-12-2023	DM5
14.	Week 14: Exercise Programs on File handling.	03		27-12-2023	DM5
15.	Week 15: Exercise Programs on File handling.	03		03-01-2024	DM5
16.	Lab Internal	03		10-01-2024	

DeliveryMethods			
DM1	ChalkandTalk	**DM4**	Assignment/Test/Quiz
DM2	ICTTools	**DM5**	Laboratory/FieldVisit
DM3	Tutorial	**DM6**	Web-basedLearning

PROGRAMME OUTCOMES (POs):

PO1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering Fundamentals and an engineering specialization to the solution of complex engineering problems.
PO2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of the information to provide valid conclusions.
PO5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations
PO6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues, and the consequent responsibilities relevant to the professional engineering practice
PO7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO8	**Ethic**s: 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 reports and design documentation, make effective presentations, and give and receive clear instructions.
PO11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO12	**Life-long learning**: Recognize the need for and have the preparation and ability to engaging 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.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	**S. Siva Ramakrishna**	**Dr. B. Srinivasa Rao**	**S. Siva Ramakrishna**	**Dr. O. Rama Devi**
Signature				