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: Dr. R. Padma Venkat
Course Name & Code : CE LAB, 23FE51
L-T-P Structure : 0-0-2   **Credits:** 01
Program/Sem/Sec : B. Tech. IT-B. 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

Note: Any Eight of the listed activates are to be conducted.

Suggested Software:

Walden Infotech
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	21-9-23		TLM4	
2.	Self Introduction & Introducing others	03	05-10-23		TLM4	
3.	Vowels & Consonants	03	12-9-23		TLM1, TLM5	
4.	Neutralization / Accent rules	03	19-9-23		TLM1, TLM5	
5.	JAM-I(Short and Structured Talks)	03	26-9-23		TLM4	
6.	Role Play-I(Formal and Informal)	03	02-11-23		TLM4	
7.	e-mail Writing, Resume writing, Cover letter, SOP	03	09-11-23		TLM1, TLM5	

8.	Group Discussion	03+3	23-11-23 30-11-23		TLM4, TLM6	
9.	Debate	03	07-12-23 14-12-23		TLM4, TLM6	
10.	PPT & Poster Presentation	03+3	21-12-23 28-12-23		TLM2, TLM4	
11.	Mock Interviews	03	04-1-24		TLM1, TLM6	
12.	Lab Internal Exam	03	11-1-24			
No. of classes required to complete Syllabus: 42				**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

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	Dr.R.Padma Venkat	Dr.R.Padma Venkat	Dr. A. Ramireddy	Dr. A. Ramireddy
Signature				

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FRESHMAN ENGINEERING DEPARTMENT
COURSE HANDOUT
PART-A

Name of Course Instructor: Dr. R. Padma Venkat
Course Name & Code   : Communicative English & 23FE01
L-T-P Structure   **: 2-0-0**   **Credits:** 02
Program/Sem/Sec   : B. Tech, I Sem -
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):

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.	Human Values: Gift of Magi	02	20-9-23 22-9-23		TLM1 TLM 6	
2.	Skimming to get main idea; Scanning for specific pieces of information	01	25-9-23		TLM2 TLM5	
3.	Mechanics of Writing: Capitalization, Spelling, Punctuation & Parts of Sentences	01	27-9-23		TLM1 TLM6 TLM5	
4.	Parts of speech	02	29-9-23 04-10-23		TLM2 TLM6	
5.	Basic Sentence Structures, Forming questions	02	06-10-23 09-10-23		TLM2 TLM6	
6.	Synonyms, Antonyms	01	11-10-23		TLM2 TLM5	
7.	Affixes, Root Words	01	13-10-23		TLM2 TLM5	

No. of classes required to complete UNIT-I: 10 | **No. of classes taken:**

UNIT-II:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
8.	Nature: The Brook by Alfred Tennyson	02	16-10-23 18-10-23		TLM1 TLM 6	
9.	Identifying Sequence of ideas, Linking ideas into a Paragraph	01	20-10-23		TLM2 TLM5	
10.	Structure of Paragraph – Paragraph Writing	02	25-10-23 27-10-23		TLM1 TLM6 TLM5	
11.	Cohesive Devices- linkers	02	27-10-23 30-10-23		TLM2 TLM6	
12.	Use of Articles and zero article, Prepositions	02	01-12-23 03-11-23		TLM2 TLM6	
13.	Homophones, Homographs, Homonyms	03	06-11-23 08-11-23 10-11-23		TLM2 TLM5	

No. of classes required to complete UNIT-II: 12 | **No. of classes taken:**

UNIT-III:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
14.	Biography: Elon Musk	02	20-11-23 22-11-23		TLM1 TLM 6	
15.	Reading and making basic inferences – recognizing and interpreting the text clues for comprehension	01	24-11-23		TLM2 TLM5	
16.	Summarizing, Note-making, Paraphrasing	02	27-11-23 29-11-23		TLM1 TLM6 TLM5	
17.	Verbs- Tenses, Subject-verb agreement	03	01-12-23 04-12-23 06-12-23		TLM2 TLM6	

18.	Compound words, Collocations	01	08-12-23		TLM2 TLM5	

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	HOD Sign Weekly
19.	Inspiration: The Toys of Peace- by Saki	02	08-12-23 11-12-23		TLM1 TLM 6	
20.	Study of graphic elements in text to display complicated data	01	13-12-23		TLM2 TLM5	
21.	Letter Writing : Official Letters, Resumes	02	15-12-23 18-12-23		TLM1 TLM6 TLM5	
22.	Reporting verbs, Direct & Indirect Speech, Active & Passive voice	02	20-12-23 22-12-23		TLM2 TLM6	
23.	Words often confused, Jargons	01	27-12-23		TLM2 TLM5	

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	HOD Sign Weekly
24.	Motivation: The Power of Interpersonal Communication	02	29-12-23 03-1-24		TLM1 TLM 6	
25.	Reading Comprehension	01	05-1-24		TLM2 TLM5	
26.	Structured Essays on specific topics	01	08-1-24		TLM1 TLM6 TLM5	
27.	Editing Texts – Correcting Common errors	01	10-1-24		TLM2 TLM6	
28.	Technical Jargon	01	12-1-23		TLM2 TLM5	

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.					TLM2 &5	
2.					TLM2 &5	
3.					TLM2 &5	

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	

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.
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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
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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	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	Dr.R.Padma Venkat	Dr.R.Padma Venkat	Dr. A. Ramireddy	Dr. A. Ramireddy
Signature				

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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/I.T-B   **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 the experiments 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-B

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 Engineering chemistry lab*	3	23-09-2023		TLM1		
2.	Preparation of a Bakelite	3	30-09-2023		TLM4	CO1	
3.	*Determination of amount of HCl using standard Na2CO3 solution*	3	07-10-2023		TLM4	CO1	
4.	Determination of Strength of an acid in Pb-Acid battery	3	14-10-2023		TLM4	CO1	
5.	Estimation of Ferrous Iron by Dichrometry	3	28-10-2023		TLM4	CO1	
6.	Conductometric titration of strong acid vs. strong base	3	04-11-2023		TLM4	CO1	
7.	Conductometric titration of weak acid vs. strong base	3	11-11-2023		TLM4	CO1	
8.	Potentiometry - determination of redox potentials and emfs	3	18-11-2023		TLM4	CO1	
9.	Preparation of nanomaterials by precipitation method	3	25-11-2023		TLM4	CO2	
10.	Verify Lambert-Beer's law	3	02-12-2023		TLM4	CO4	
11.	Wavelength measurement of sample through UV-Visible Spectroscopy	3	09-12-2023		TLM4	CO4	
12.	Identification of simple organic compounds by IR	3	16-12-2023		TLM4	CO4	
13.	Revision	3	23-12-2023		TLM4	CO4	
14.	Revision	3	30-12-2023		TLM4	CO4	
15.	*Internal Exam*	3	06-01-2024		TLM4	CO4	
	Total						

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:

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				

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DEPARTMENT OF FRESHMANENGINEERING

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/I.T-B   **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 energy diagrams 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 different applications(Understand)
CO4	Outline the importance of polymers and conducting polymers in advanced technologies(Understand)
CO5	Understand the fundamentals of UV-Visible, IR spectroscopic techniques and basic principles 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	19-09-2023		TLM1	
2.		1	20-09-2023		TLM1	
3.	Bridge Course	1	21-09-2023		TLM1	
4.		1	23-09-2023		TLM1	
5.	Fundamentals Of Quantum Mechanics	1	26-09-2023		TLM1	
6.	Schrodinger Wave Equation	1	27-09-2023		TLM1	
7.	Significance of Ψ and Ψ^2	1	30-09-2023		TLM1	
8.	Particle In one dimensional box	1	03-10-2023		TLM2	
9.	Molecular Orbital Theory – Bonding in Homo- and Heteronuclear Diatomic Molecules	1	04-10-2023		TLM1	
10.	Energy level diagrams of O_2 and CO	1	05-10-2023		TLM1	
11.	π-molecular orbitals of butadiene	1	07-10-2023		TLM2	
12.	π-molecular orbitals ofbenzene	1	10-10-2023		TLM1	
13.	Calculation of Bondorder	1	11-10-2023		TLM1	
14.	Practice of Molecular orbital diagrams	1	12-10-2023		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	14-10-2023		TLM1	
2.	Semiconductors - Basic concept&applications	1	17-10-2023		TLM1	
3.	Super conductors - Introduction	1	18-10-2023		TLM2	
4.	Super conductors - Basic concept&applications	1	19-10-2023&25-10-23		TLM1	
5.	Supercapacitors - Introduction	1	26-10-2023		TLM1	
6.	Supercapacitors - Basic concept-classification&applications	1	28-10-2023&31-10-23		TLM1	
7.	Nano materials - Introduction	1	01-11-2023		TLM2	
8.	Nano materials - classification	1	02-11-2023		TLM2	
9.	Nano materials - properties and applications of fullerenes	1	04-11-2023&07-11-23		TLM2	
10.	Nano materials - carbon nano tubes and graphine nanoparticles	1	08-11-2023& 09-11-23		TLM2	
No. of classes required to complete UNIT-II: 14			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	21-11-2023		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	25-11-2023		TLM2	
5.	Electrochemical sensors – potentiometric sensors with examples, amperometric sensors with examples	1	28-11-2023		TLM1	
6.	Primary cells – Zinc-air	1	29-11-		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
	battery, Secondary cells – lithium-ion batteries- working of the batteries including cell reactions		2023& 30-11-23			
7.	Fuel cells, hydrogen-oxygenfuel cell– working of the cells	1	02-12-2023		TLM2	
8.	PolymerElectrolyte Membrane Fuel cells (PEMFC)	1	05-12-2023		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	09-12-2023		TLM2	
4.	Plastics –Thermo and Thermosetting plastics	1	12-12-23		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	16-12-2023& 19-12-2023		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		TLM1	
No. of classes required to complete UNIT-IV: 10				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	23-12-2023		TLM1	
2.	Absorption of radiation: Beer-Lambert's law	1	26-12-2023		TLM1	

S.No.	Topic	No. of Classes	Tentative Date	Actual Date	TLM	HOD Sign
3.	UV-Visible Spectroscopy	1	27-12-2023		TLM1	
4.	electronic transition, Instrumentation	1	28-12-2023		TLM1	
5.	IR spectroscopies, fundamental modes	1	30-12-2023		TLM2	
6.	selection rules, Instrumentation	1	02-01-2024&03-01-24		TLM1	
7.	Chromatography-Basic Principle	1	04-01-2024		TLM2	
8.	Classification-HPLC: Principle, Instrumentation and Applications	1	06-01-2024&09-01-24		TLM1	
No. of classes required to complete UNIT-V: 12				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	10-01-2024 &11-01-2024		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 engineering problems.
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,andtheculutral,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 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 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	Dr.V.Parvathi	Dr.V.Parvathi	Dr.A.Rami Reddy
Signature				

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DEPARTMENT OF FRESHMANENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr. V.Parvathi
Course Name & Code :Chemistry & 23FE02
L-T-P Structure :3-0-0   **Credits:03**
Program/Sem/Sec : B.Tech/Isem/IT-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.	Fundamentals Of Quantum Mechanics	1	29-09-2023		TLM1	
7.	Schrodinger Wave Equation	1	04-10-2023		TLM1	
8.	Significance of Ψ and Ψ^2	1	05-10-2023		TLM1	
9.	Particle In one dimensional box	1	06-10-2023		TLM1	
10.	Molecular Orbital Theory – Bonding in Homo- and Heteronuclear Diatomic Molecules	1	09-10-2023		TLM1	
11.	Energy level diagrams of O_2 and CO	1	11-10-2023		TLM1	
12.	π-molecular orbitals of butadiene	1	12-10-2023		TLM1	
13.	π-molecular orbitals of benzene	1	13-10-2023		TLM1	
14.	Calculation of Bond order	1	16-10-2023		TLM1	
15	Practice of Molecular orbital diagrams	1	18-10-2023		TLM3	
16	Practice of Molecular orbital diagrams	1	19-10-2023		TLM3	
No. of classes required to complete UNIT-I: 16				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	25-10-2023		TLM1	
2.	Semiconductors - Basic concept&applications	1	26-10-2023		TLM1	
3.	Super conductors - Introduction	1	27-10-2023		TLM1	
4.	Super conductors - Basic concept&applications	1	30-10-2023		TLM1	
5.	Supercapacitors - Introduction	1	01-11-2023		TLM1	
6.	Supercapacitors - Basic concept-classification&applications	1	02-11-2023		TLM1	
7.	Nano materials - Introduction	1	03-11-2023		TLM2	
8.	Nano materials - classification	1	04-11-2023		TLM2	
9.	Nano materials - properties and applications of fullerenes	1	06-11-2023		TLM2	
10.	Nano materials - carbon nano tubes and graphine nanoparticles	1	07-11-2023		TLM2	
11	Revision for mid 1	1	08-11-2023		TLM1	
12	Revision for mid 1	1	11-11-2023		TLM1	
No. of classes required to complete UNIT-II: 12				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	16-11-2023		TLM1	
2.	Cell potential calculations and numerical problems	1	17-11-2023		TLM1	
3.	Continue...numerical problems.		20-11-2023		TLM1	
4.	Potentiometry-potentiometric titrations (redox titrations)	1	22-11-2023		TLM1	
5.	Concept of conductivity, conductivitycell,conducto	1	23-11-2023		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
	metric titrations (acid-base titrations)					
6.	Electrochemical sensors – potentiometric sensors with examples, amperometric sensors with examples	1	24-11-2023		TLM1	
7.	Primary cells – Zinc-air battery, Secondary cells – - working of the batteries including cell reactions	1	27-11-2023		TLM1	
8.	lithium-ion batteries working of the batteries including cell reactions	1	29-11-2023		TLM1	
9	Fuel cells, hydrogen-oxygenfuel cell– working of the cells	1	30-11-2023		TLM1	
10	PolymerElectrolyte Membrane Fuel cells (PEMFC)	1	01-12-2023		TLM1	
No. of classes required to complete UNIT-III: 10			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	04-12-2023		TLM1	
2.	Chain growth and step growth polymerization, coordination polymerization, with specific examples	1	06-12-2023		TLM1	
3.	Mechanisms of polymer formation	1	07-12-2023		TLM1	
4.	Plastics –Thermo and Thermosetting plastics	1	08-12-2023		TLM1	
5.	Preparation, properties and applications of – PVC, Teflon, Bakelite, Nylon-6,6, carbon fibres	1	11-12-2023		TLM1	
6.	Elastomers–Buna-S, Buna-N–preparation, properties and applications	1	13-12-2023		TLM1	
7.	Conducting polymers – polyacetylene, polyaniline, – mechanism of conduction and applications	1	14-12-2023		TLM1	
8.	Contd conducting polymers.	1	15-12-2023		TLM1	

9	Bio-Degradable polymers - Poly Glycolic Acid (PGA), Polyl Lactic Acid (PLA)		18-12-2023		TLM1	
10	Practise of equations for preparation of polymers		20-12-2023		TLM3	

No. of classes required to complete UNIT-IV: 10	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	21-12-2023		TLM1	
2.	Absorption of radiation: Beer-Lambert's law	1	22-12-2023		TLM1	
3.	UV-Visible Spectroscopy	1	27-12-2023		TLM1	
4.	electronic transition, Instrumentation	1	28-12-2023		TLM1	
5.	IR spectroscopies, fundamental modes	1	29-12-2023		TLM1	
6.	selection rules, Instrumentation	1	03-01-202		TLM1	
7.	Chromatography-Basic Principle	1	04-01-202		TLM1	
8.	Classification-HPLC: Principle, Instrumentation and Applications	1	05-01-202		TLM1	
9	Revision	1	08-01-202		TLM1	
10	Revision	1	10-01-202		TLM1	

No. of classes required to complete UNIT-V: 10	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	11-01-202		TLM1	
2	Applications of polymers in advanced technologies .	1	12-01-202			

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 theinformation to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modernengineering 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, 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	Dr. V.Parvathi	Dr.V.Parvathi	Dr.V.Parvathi	Dr.A.Rami Reddy
Signature				

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Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF FRESHMANENGINEERING

COURSE HANDOUT
PART-A

Name of Course Instructor: Dr. V.Parvathi
Course Name & Code   : Chemistry Lab&23FE52
L-T-P Structure   :0-0-3   **Credits:**1.5
Program/Sem/Sec   : B.Tech/Isem/IT-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 the experiments 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 Engineering chemistry lab*	3	*23-09-2023*		TLM1		
2.	Preparation of a Bakelite	3	30-09-2023		TLM4	CO1	
3.	*Determination of amount of HCl using standard Na2CO3 solution*	3	*07-10-2023*		TLM4	CO1	
4.	Determination of Strength of an acid in Pb-Acid battery	3	*14-10-2023*		TLM4	CO1	
5.	Estimation of Ferrous Iron by Dichrometry	3	*28-10-2023*		TLM4	CO1	
6.	Conductometric titration of strong acid vs. strong base	3	*04-11-2023*		TLM4	CO1	
7.	Conductometric titration of weak acid vs. strong base	3	11-11-2023		TLM4	CO1	
8.	Potentiometry - determination of redox potentials and emfs	3	*25-11-2023*		TLM4	CO1	
9.	Preparation of nanomaterials by precipitation method	3	*02-12-2023*		TLM4	CO2	
10.	Verify Lambert-Beer's law	3	*09-12-2023*		TLM4	CO4	
11.	Wavelength measurement of sample through UV-Visible Spectroscopy	3	*16-12-2023*		TLM4	CO4	
12.	Identification of simple organic compounds by IR	3	*23-12-2023*		TLM4	CO4	
13.	Additional experiment	3	*30-12-2023*		TLM4	CO1	
14	*Additional Experiment*	3	*06-01-2024*		TLM4	CO1	
15	*Internal Exam*	3	*13-01-2024*		TLM4		
	Total						

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

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 engineeringsciences.
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 environmentalconsiderations.
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 thelimitations.
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 engineeringpractice.
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 sustainabledevelopment.
8. **Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineeringpractice.
9. **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinarysettings.
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 clearinstructions.
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 multidisciplinaryenvironments.
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	Dr.V.Parvathi	Dr.V.Parvathi	Dr.V.Parvathi	Dr.A.Rami Reddy
Signature				

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LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING, (AUTONOMOUS)
Accredited by NAAC with 'A' Grade & NBA (Under Tier - I),
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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

PROGRAM   **:** I B. Tech., I-Sem., IT-B
ACADEMIC YEAR   **:** 2023-24
COURSE NAME & CODE   **:** Linear Algebra & Calculus
L-T-P STRUCTURE   **:** 3-0-0
COURSE CREDITS   **:** 3
COURSE INSTRUCTOR   **:** Dr. A. Rami Reddy
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	8	08-09-2023 TO 16-09-2023	08-09-2023 TO 16-09-2023	TLM1			
2.	Introduction to the course	1	19-09-2023		TLM2			
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	22-09-2023		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	06-10-2023		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	13-10-2023		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	25-10-2023		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	27-10-2023		TLM1	CO2	T1,T2	
25.	Quadratic Forms	1	28-10-2023		TLM1	CO2	T1,T2	
26.	Nature of Quadratic Forms	1	30-10-2023		TLM1	CO2	T1,T2	
27.	Reduction of Quadratic form to Canonical form	1	31-10-2023		TLM1	CO2	T1,T2	
28.	Orthogonal Transformation	1	01-11-2023		TLM1	CO2	T1,T2	
29.	Orthogonal Transformation	1	03-11-2023		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 (13-11-2023 TO 18-11-2023)

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	06-11-2023		TLM1	CO3	T1,T2	
32.	Mean Value theorem	1	07-11-2023		TLM1	CO3	T1,T2	
33.	Rolle's theorem	1	08-11-2023		TLM1	CO3	T1,T2	
34.	Lagrange's mean value theorem	1	10-11-2023		TLM1	CO3	T1,T2	
35.	Lagrange's mean value theorem	1	20-11-2023		TLM1	CO3	T1,T2	
36.	Cauchy's mean value theorem	1	21-11-2023		TLM1	CO3	T1,T2	
37.	Cauchy's mean value theorem	1	22-11-2023		TLM1	CO3	T1,T2	
38.	Taylor's theorem with remainders	1	24-11-2023		TLM1	CO3	T1,T2	
39.	Taylor's theorem	1	25-11-2023		TLM1	CO3	T1,T2	
40.	Maclaurin's theorem	1	27-11-2023		TLM1	CO3	T1,T2	
41.	Problems and applications	1	28-11-2023		TLM1	CO3	T1,T2	
42.	**TUTORIAL 3**	1	02-12-2023		TLM3	CO3	T1,T2	
No. of classes required to complete UNIT-III		12			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
43.	Introduction to Unit IV	1	29-11-2023		TLM1	CO4	T1,T2	
44.	Functions of several variables	1	01-12-2023		TLM1	CO4	T1,T2	
45.	Continuity and Differentiability	1	04-12-2023		TLM1	CO4	T1,T2	
46.	Partial Derivatives	1	05-12-2023		TLM1	CO4	T1,T2	
47.	Total derivatives, Chain rule, Directional Derivative	1	06-12-2023		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
48.	Taylor's Series expansion	1	08-12-2023		TLM1	CO4	T1,T2	
49.	Maclaurin's series expansion	1	11-12-2023		TLM1	CO4	T1,T2	
50.	Jacobian	1	12-12-2023		TLM1	CO4	T1,T2	
51.	Functional Dependence	1	13-12-2023		TLM1	CO4	T1,T2	
52.	Maxima and Minima	1	15-12-2023		TLM1	CO4	T1,T2	
53.	Maxima and Minima	1	16-12-2023		TLM1	CO4	T1,T2	
54.	Lagrange Multiplier Method	1	18-12-2023		TLM1	CO4	T1,T2	
55.	Lagrange Multiplier Method	1	19-12-2023		TLM1	CO4	T1,T2	
56.	**TUTORIAL 4**	1	23-12-2023		TLM3	CO4	T1,T2	
No. of classes required to complete UNIT-IV		14			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
57.	Introduction to Unit-V	1	20-12-2023		TLM1	CO5	T1,T2	
58.	Double Integrals - Cartesian coordinates	1	22-12-2023		TLM1	CO5	T1,T2	
59.	Double Integrals - Cartesian coordinates	1	26-12-2023		TLM1	CO5	T1,T2	
60.	Double Integrals- Polar co ordinates	1	27-12-2023		TLM1	CO5	T1,T2	
61.	Triple Integrals - Cartesian coordinates	1	29-12-2023		TLM1	CO5	T1,T2	
62.	Triple Integrals - Spherical coordinates	1	30-12-2023		TLM1	CO5	T1,T2	
63.	Change of order of Integration	1	02-01-2024		TLM1	CO5	T1,T2	
64.	Change of order of Integration	1	03-01-2024		TLM1	CO5	T1,T2	
65.	Change of variables	1	05-01-2024		TLM1	CO5	T1,T2	
66.	Finding area by double Integral	1	06-01-2024		TLM1	CO5	T1,T2	
67.	Finding Volume by double and triple Integral	1	08-01-2024		TLM1	CO5	T1,T2	
68.	Revision	1	09-01-2024		TLM1	CO5	T1,T2	
69.	**TUTORIAL 5**	1	10-01-2024		TLM3	CO5	T1,T2	
No. of classes required to complete UNIT-V		13			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
70.	Other applications of double integral	1	12-01-2024		TLM2	CO5	T1,T2	
No. of classes		1			No. of classes taken:			
II MID EXAMINATIONS (15-01-2024 TO 20-01-2024)								

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 (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 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	**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.

DR.A.RAMI REDDY	**Dr. A. RAMI REDDY**	**Dr. A. RAMI REDDY**	**Dr. A. RAMI REDDY**
Course Instructor	Course Coordinator	Module Coordinator	HOD

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FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT
Part-A

PROGRAM	**:** I B. Tech., I-Sem., IT - A
ACADEMIC YEAR	**:** 2023-24
COURSE NAME & CODE	**:** Linear Algebra & Calculus
L-T-P STRUCTURE	**:** 3-0-0
COURSE CREDITS	**:** 3
COURSE INSTRUCTOR	**:** Dr. K. Jhansi Rani
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 conceptto 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.

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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.

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	8	08-09-2023 TO 16-09-2023	08-09-2023 TO 16-09-2023	TLM1			
2.	Introduction to the course	1	19-09-2023		TLM2			
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	22-09-2023		TLM1	CO1	T1,T2	
6.	Echelon form	1	23-09-2023		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	06-10-2023		TLM1	CO1	T1,T2	
15.	Jacobi Iteration Method	1	07-10-2023		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	13-10-2023		TLM1	CO2	T1,T2	
20.	Eigen values, Eigen vectors	1	14-10-2023		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	25-10-2023		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	26-10-2023		TLM1	CO2	T1,T2	
25.	Quadratic Forms	1	27-10-2023		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	31-10-2023		TLM1	CO2	T1,T2	
28.	Orthogonal Transformation	1	01-11-2023		TLM1	CO2	T1,T2	
29.	Orthogonal Transformation	1	02-11-2023		TLM1	CO2	T1,T2	
30.	**TUTORIAL 2**	1	03-11-2023		TLM3	CO2	T1,T2	
No. of classes required to complete UNIT-II		13			No. of classes taken:			

I MID EXAMINATIONS (13-11-2023 TO 18-11-2023)

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	04-11-2023		TLM1	CO3	T1,T2	
32.	Mean Value theorem	1	07-11-2023		TLM1	CO3	T1,T2	
33.	Rolle's theorem	1	08-11-2023		TLM1	CO3	T1,T2	
34.	Lagrange's mean value theorem	1	09-11-2023		TLM1	CO3	T1,T2	
35.	Lagrange's mean value theorem	1	10-11-2023		TLM1	CO3	T1,T2	
36.	Cauchy's mean value theorem	1	21-11-2023		TLM1	CO3	T1,T2	
37.	Cauchy's mean value theorem	1	22-11-2023		TLM1	CO3	T1,T2	
38.	Taylor's theorem with remainders	1	23-11-2023		TLM1	CO3	T1,T2	
39.	Taylor's theorem	1	24-11-2023		TLM1	CO3	T1,T2	
40.	Maclaurin's theorem	1	25-11-2023		TLM1	CO3	T1,T2	
41.	Problems and applications	1	28-11-2023		TLM1	CO3	T1,T2	
42.	**TUTORIAL 3**	1	29-11-2023		TLM3	CO3	T1,T2	
No. of classes required to complete UNIT-III		12			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
43.	Introduction to Unit IV	1	30-11-2023		TLM1	CO4	T1,T2	
44.	Functions of several variables	1	01-12-2023		TLM1	CO4	T1,T2	
45.	Continuity and Differentiability	1	02-12-2023		TLM1	CO4	T1,T2	
46.	Partial Derivatives	1	05-12-2023		TLM1	CO4	T1,T2	
47.	Total derivatives, Chain rule, Directional Derivative	1	06-12-2023		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
48.	Taylor's Series expansion	1	07-12-2023		TLM1	CO4	T1,T2	
49.	Maclaurin's series expansion	1	08-12-2023		TLM1	CO4	T1,T2	
50.	Jacobian	1	12-12-2023		TLM1	CO4	T1,T2	
51.	Functional Dependence	1	13-12-2023		TLM1	CO4	T1,T2	
52.	Maxima and Minima	1	14-12-2023		TLM1	CO4	T1,T2	
53.	Maxima and Minima	1	15-12-2023		TLM1	CO4	T1,T2	
54.	Lagrange Multiplier Method	1	16-12-2023		TLM1	CO4	T1,T2	
55.	Lagrange Multiplier Method	1	19-12-2023		TLM1	CO4	T1,T2	
56.	**TUTORIAL 4**	1	23-12-2023		TLM3	CO4	T1,T2	
No. of classes required to complete UNIT-IV		14			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
57.	Introduction to Unit-V	1	20-12-2023		TLM1	CO5	T1,T2	
58.	Double Integrals - Cartesian coordinates	1	21-12-2023		TLM1	CO5	T1,T2	
59.	Double Integrals - Cartesian coordinates	1	22-12-2023		TLM1	CO5	T1,T2	
60.	Double Integrals- Polar co ordinates	1	26-12-2023		TLM1	CO5	T1,T2	
61.	Triple Integrals - Cartesian coordinates	1	27-12-2023		TLM1	CO5	T1,T2	
62.	Triple Integrals - Spherical coordinates	1	28-12-2023		TLM1	CO5	T1,T2	
63.	Change of order of Integration	1	29-12-2023		TLM1	CO5	T1,T2	
64.	Change of order of Integration	1	30-12-2023		TLM1	CO5	T1,T2	
65.	Change of variables	1	02-01-2024		TLM1	CO5	T1,T2	
66.	Finding area by double Integral	1	03-01-2024		TLM1	CO5	T1,T2	
67.	Finding Volume by double and triple Integral	1	04-01-2024		TLM1	CO5	T1,T2	
68.	Revision	1	05-01-2024		TLM1	CO5	T1,T2	
69.	**TUTORIAL 5**	1	06-01-2024		TLM3	CO5	T1,T2	
No. of classes required to complete UNIT-V		14			No. of classes taken:			

Content beyond the Syllabus

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
70.	Other applications of double integral	2	09-01-2024 10-01-2024		TLM2	CO5	T1,T2	
No. of classes		2			No. of classes taken:			

II MID EXAMINATIONS (15-01-2024 TO 20-01-2024)

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 (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 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. K. Jhansi Rani	**Dr. A. RAMI REDDY**	**Dr. A. RAMI REDDY**	**Dr. A. RAMI REDDY**
Course Instructor	Course Coordinator	Module Coordinator	HOD

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DEPARTMENT OF INFORMATION TECHNOLOGY

COURSE HANDOUT
PART-A

Name of Course Instructor: Mr.A.PRATYUSH
Course Name & Code : BC&ME, 23CM01
L-T-P Structure : **5-0-0**   **Credits:** 3
Program/Sem/Sec : B.Tech/I-Sem/**B-Sec**   **A.Y.:** **2023-24**
PREREQUISITE: NO

COURSE EDUCATIONAL OBJECTIVES (CEOs): The students after completing the course are expected to

- 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 introduction basic of robotics and its applications.

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

CO1	Summarize the different manufacturing processes. (Remember-L1)
CO2	Explain the basics of thermal engineering and its applications. (Understand-L2)
CO3	Illustrate the working of different mechanical power transmission systems and power plants (Understand-L2)
CO4	Describe the basics of robotics and its 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	1	1	-	-	-	-	-	-	-	-	1	-	-	-
CO2	2	2	-	1	-	-	-	-	-	-	-	1	-	-	-
CO3	3	3	1	1	-	-	-	-	-	-	-	-	-	-	-
CO4	2	2	1	1	-	-	-	-	-	-	-	1	-	-	-
	1 - Low				**2 –**Medium				**3 -** High						

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.

T3 An introduction to Mechanical Engg by Jonathan Wicker and Kemper Lewis, Cengage learning India Pvt. Ltd.

REFERENCE BOOKS:
R1 G. Shanmugam and M.S.Palanisamy, Basic Civil and the Mechanical Engineering, Tata McGraw Hill publications (India) Pvt. Ltd.

R2 Thermal Engineering by Mahesh M Rathore Tata McGraw Hill publications (India) Pvt. Ltd.

R3. 3D printing & Additive Manufacturing Technology- L. Jyothish Kumar, Pulak M Pandey, Springer publications

R4. Appuu Kuttan KK, Robotics, I.K. International Publishing House Pvt. Ltd. Volume-I

PART-B

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 Mechanical Engineering	1	19-09-2023		TLM1	
2.	Role of Mechanical Engineering in Industries and Society	1	20-09-2023		TLM1	
3.	Technologies in different sectors such as Energy.	1	22-09-2023		TLM1	
4.	Technologies in different sectors such as Manufacturing.	1	23-09-2023		TLM1	
5.	Technologies in different sectors such as Automotive.	1	25-09-2023		TLM1	
6.	Technologies in different sectors such as Aerospace, and Marine sectors.	1	26-09-2023		TLM1	
7.	Engineering Materials - Metals	1	27-09-2023		TLM1	
8.	Ferrous Metals	1	29-09-2023		TLM1	
9.	Non-ferrous Metals	1	30-09-2023		TLM1	
10.	Ceramics.	1	03-10-2023		TLM1	
11.	Composites.	1	04-10-2023		TLM1	
12.	Smart materials.	1	06-10-2023		TLM1	
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	HOD Sign Weekly
13.	Manufacturing Processes	1	07-10-2023		TLM1	
14.	Principles of Casting,	1	09-10-2023		TLM1	
15.	Forming,	1	10-10-2023		TLM1	
16.	joining processes,	1	11-10-2023		TLM2	
17.	Machining,	1	13-10-2023		TLM1	
18.	Introduction to CNC machines,	1	14-10-2023		TLM2	
19.	3D printing, and Smart manufacturing.	1	16-10-2023		TLM2	
20.	Thermal Engineering- Working	1	17-10-2023		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
	principle of Boilers					
21.	Working principle of Boilers	1	17-10-2023		TLM2	
22.	Otto cycle	1	18-10-2023		TLM1	
23	Diesel cycle	1	25-10-2023		TLM1	
24	Refrigeration and air-conditioning cycles	1	25-10-2023		TLM1	
25	IC engines	1	27-10-2023		TLM2	
26	2-Stroke and 4-Stroke engines	1	28-10-2023		TLM1	
27	2-Stroke and 4-Stroke engines	1	28-10-2023		TLM1	
28	SI/CI Engines	1	30-10-2023		TLM2	
29	Components of Electric and Hybrid Vehicles.	1	31-10-2023		TLM1	
No. of classes required to complete UNIT-II: 17				No. of classes taken:		

UNIT-III:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
30	Power plants – Working principle of Steam power plants	1	01-11-2023		TLM1	
31	Power plants – Working principle of Diesel power plants	1	03-11-2023		TLM1	
32	Power plants – Working principle of Hydro power plants	1	04-11-2023		TLM1	
33	Power plants – Working principle of Nuclear power plants	1	06-11-2023		TLM1	
34	Mechanical Power Transmission - Belt Drives.	1	07-11-2023		TLM1	
35	Chain, Rope drives.	1	08-11-2023		TLM1	
36	Gear Drives and their applications.	1	08-11-2023		TLM2	
37	Introduction to Robotics- Joints & links.	1	10-11-2023		TLM2	
38	Configurations and applications of robotics.	1	11-11-2023		TLM2	
I-Mid Exams			13-11-2023 to 18-11-2023			
No. of classes required to complete UNIT-III: 09				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 (R17 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:
PO 2	Problem analysis
PO 3	Design/development of solutions
PO 4	Conduct investigations of complex problems
PO 5	Modern tool usage
PO 6	The engineer and society
PO 7	Environment and sustainability
PO 8	Ethics
PO 9	Individual and team work
PO 10	Communication
PO 11	Project management and finance
PO 12	Life-long learning

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 for 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	Mr.A.Pratyush			
Signature				

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DEPARTMENT OF INFORMATION TECHNOLOGY

COURSE HANDOUT

PART-A

Name of Course Instructor : **Mr. V . V. Krishna Reddy**
Course Name & Code : **Introduction to Programming (23CS01)**
L-T-P Structure : **3-0-0**   **Credits: 3**
Program/Sem/Sec : **B.Tech.–IT /I Sem-B**   **A.Y.: 2023-24**

PRE-REQUISITE: Fundamentals of Mathematics.

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.	Analyze – Level 4
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.	Apply – Level 3

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	-	-	-	-	-	-	-	-	-	-	-	1	-	-
CO2	3	-	-	-	-	-	-	-	-	-	-	-	2	-	-
CO3	3	2	-	-	-	-	-	-	-	-	-	-	2	-	-
CO4	3	2	-	-	-	-	-	-	-	-	-	-	2	-	-
CO5	3	-	-	-	-	-	-	-	-	-	-	-	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, Reema Thareja, 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	19-09-2023		**TLM1/ TLM2**	
2.	History of Computers	1	20-09-2023		**TLM1/ TLM2**	
3.	Basic organization of a computer: ALU, input-output units.	2	22-09-2023 / 23-09-2023		**TLM1/ TLM2**	
4.	Memory, program counter	1	25-09-2023		**TLM1/ TLM2**	
5.	Introduction to Programming Languages,	1	26-09-2023		**TLM1/ TLM2**	
6.	Basics of a Computer Program-Algorithms	1	27-09-2023		**TLM1/ TLM2**	
7.	Flowcharts (Using Dia Tool), pseudo code.	1	29-09-2023		**TLM1/ TLM2**	
8.	Introduction to Compilation and Execution	1	30-09-2023		**TLM1/ TLM2**	
9.	Primitive Data Types	2	03-10-2023 / 04-10-2023		**TLM1/ TLM2**	
10.	Variables, and Constants, Basic Input and Output operations	2	06-10-2023 / 07-10-2023		**TLM1/ TLM2**	
11.	Type Conversion, and Casting	1	09-10-2023		**TLM1/ TLM2**	
12.	**Problem solving techniques:** Algorithmic approach, characteristics of algorithm	1	10-10-2023		**TLM1/ TLM2**	
13.	Problem solving strategies: Top-down approach, Bottom-up approach	2	11-10-2023 / 13-10-2023		**TLM1/ TLM2**	
14	Time and space complexities of algorithms.	2	14-10-2023 / 16-10-2023		**TLM1/ TLM2**	
No. of classes required to complete UNIT – I: 19				**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.	Conditional Statements	1	17-10-2023		**TLM1/ TLM2**	
16.	if, if-else, nested if-else , else-if ladder	3	18-10-2023 / 25-10-2023 / 27-10-2023		**TLM1/ TLM2**	
17.	switch	1	28-10-2023		**TLM1/ TLM2**	
18.	Example programs on Decision Making and Branching	2	30-10-2023 / 31-10-2023		**TLM1/ TLM2**	
19.	Loops: while , Example programs	2	01-11-2023 / 03-11-2023		**TLM1/ TLM2**	
20.	do-while, for	1	04-11-2023		**TLM1/ TLM2**	
21.	Example programs on Loops	1	06-11-2023		**TLM1/ TLM2**	
22.	Break and Continue	1	07-11-2023		**TLM1/ TLM2**	
23.	Example programs on Patterns	2	08-11-2023 / 10-11-2023		**TLM1/ TLM2**	
24.	Revision	1	11-11-2023			
No. of classes required to complete UNIT – II: 15				**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/ TLM2**	
26.	Array indexing, Accessing elements	1	21-11-2023		**TLM1/ TLM2**	
27.	memory model	1	22-11-2023		**TLM1/ TLM2**	
28.	programs with array of integers	1	24-11-2023		**TLM1/ TLM2**	
29.	Introduction to two dimensional arrays	1	25-11-2023 / 27-11-2023		**TLM1/ TLM2**	
30.	2D Array indexing, Accessing elements	1	28-11-2023		**TLM1/ TLM2**	
31.	programs with 2D arrays	1	29-11-2023		**TLM1/ TLM2**	
32.	Introduction to Strings	1	01-12-2023		**TLM1/ TLM2**	
33.	Reading and Writing Operations on Strings	1	02-12-2023		**TLM1/ TLM2**	
34.	String Handling Functions	2	04-12-2023 / 05-12-2023		**TLM1/ TLM2**	
35.	Example Programs using Strings	1	06-12-2023		**TLM1/ TLM2**	
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	08-12-2023		**TLM1/ TLM2**	
37.	dereferencing and address operators	1	09-12-2023		**TLM1/ TLM2**	
38.	pointer and address arithmetic	1	11-12-2023		**TLM1/ TLM2**	
39.	array manipulation using pointers	2	12-12-2023 / 13-12-2023		**TLM1/ TLM2**	
40.	User-defined data types	1	15-12-2023		**TLM1/ TLM2**	
41.	Structures , Definition and Initialization	2	16-12-2023 / 18-12-2023		**TLM1/ TLM2**	
42.	Example programs	1	19-12-2023		**TLM1/ TLM2**	
43.	Unions	2	20-12-2023 / 22-12-2023		**TLM1/ TLM2**	
44.	Example programs	1	23-12-2023		**TLM1/ TLM2**	
45.	Revision	1	26-12-2023		**TLM1/ TLM2**	
No. of classes required to complete UNIT – IV: 13				**No. of classes taken:**		

UNIT – V:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
46.	Introduction to Functions	1	27-12-2023		**TLM1/ TLM2**	
47.	Function Declaration and Definition	1	29-12-2023		**TLM1/ TLM2**	
48.	Function call Return Types	1	30-12-2023		**TLM1/ TLM2**	
49.	Arguments	1	01-01-2024		**TLM1/ TLM2**	
50.	modifying parameters inside functions using pointers	2	02-01-2024 / 03-01-2024		**TLM1/ TLM2**	
51.	arrays as parameters	1	05-01-2024		**TLM1/ TLM2**	

52.	Scope and Lifetime of Variables	1	06-01-2024		**TLM1/ TLM2**	
53.	Introduction to Files	1	08-01-2024		**TLM1/ TLM2**	
54.	Basics of File Handling	1	09-01-2024		**TLM1/ TLM2**	
55.	Operations on Files	1	10-01-2024		**TLM1/ TLM2**	
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/ TLM2**	
57.	Introduction to Data Structures	1	13-12-2023		**TLM1/ TLM2**	

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):

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 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 responsibilities relevant to the professional engineering practice
PO7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO8	**Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO9	**Individual and 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	Organize, Analyze and Interpret the data to extract meaningful conclusions.
PSO2	Design, Implement and evaluate a computer-based system to meet desired needs.
PSO3	Develop IT application services with the help of different current engineering tools.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Mr. V .V. Krishna Reddy	Dr. B. Srinivas Rao	Dr. Phaneendra K	Dr. B. Srinivas Rao
Signature				