Sri Indu Institute of Engineering and Technology (Autonomous)
(Formerly RVR Institute of Engineering & Technology)
An Autonomous Institution Under UGC
NAAC Accredited. Recognized Under 2(f) of UGC Act 1956
ESTD : 2007
EAMCET CODE: INDI
Approved by AICTE, New Delhi, & Affiliated to JNTUH, Hyderabad.
JNTUH CODE: X3

COURSE FILE

ON

ORDINARY DIFFERENTIAL EQUATIONS & VECTOR CALCULUS

Course Code – MA201BS

I B. Tech Semester-II
A.Y. 2022-23

Prepared by

T Thirupathi Reddy
Asst. Professor

Head of the Department
Department of H&S
SRI INDU INSTITUTE OF ENGG & TECH
Sheriguda(V), Ibrahimpatnam (M), R.R. Dist-501 510

PRINCIPAL
Sri Indu Institute of Engineering & Tech.
Sheriguda(Vill), Ibrahimpatnam
R.R. Dist. Telangana-501 510.

Index of Course File

COURSE FILE INDEX	
S.No	**Course/Subject Name**
1	Institute Vision & Mission
2	POs /PSOs
3	Course Structure
4	Course syllabus
5	Course Outcomes (CO)
6	Mapping CO with PO/PSO; course with PO/PSO
7	Academic Calendar
8	Time table - highlighting your course periods including tutorial
9	Lesson plan with number of hours/periods, TA/TM, Text/Reference book
10	Gap within the syllabus - mapping to CO, PO/PSO
11	Gaps beyond the syllabus - Mapping to PO/PSO
12	Web references
13	Lecture notes
14	List of Power point presentations / Videos
15	University Question papers
16	Internal Question papers, Key with CO and BTL
17	Assignment Question papers mapped with CO and BTL
18	Scheme of evaluation with CO and BTL mapping
19	Tutorial topics with evidence
20	Result Analysis to identify weak and advanced learners
21	Result Analysis at the end of the course
22	Remedial class schedule and evidences
23	CO, PO/PSO attainment
24	Attendance register
25	Course file (Digital form)

INSTITUTE VISION & MISSION

Vision:

To become a premier institute of academic excellence by providing the world class education that individuals transforms into high intellectuals, by evolving them as empathetic and responsible citizens through continuous improvement.

Mission:

- **IM1:** To offer outcome-based education and enhancement of technical and practical skills.
- **IM2:** To Continuous assess of teaching-learning process through institute-industry collaboration.
- **IM3:** To be a centre of excellence for innovative and emerging fields in technology development with state-of-art facilities to faculty and students' fraternity.
- **IM4:** To Create an enterprising environment to ensure culture, ethics and social responsibility among the stakeholders.

Head of the Department
Department of H&S
SRI INDU INSTITUTE OF ENGG & TECH
Sheriguda(V), Ibrahimpatnam (M), R.R. Dist-501 510

PRINCIPAL
Sri Indu Institute of Engineering & Tech.
Sheriguda(Vill), Ibrahimpatnam
R.R. Dist. Telangana-501 510.

PROGRAM OUTCOMES

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, 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 assessocietal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: **ENVIRONMENT AND SUSTAINABILITY**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8: **ETHICS**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: **INDIVIDUAL AND TEAM WORK**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10: **COMMUNICATION**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, 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 engage in independent and life-long learning in the broadest context of technological change

Head of the Department
Department of H&S
SRI INDU INSTITUTE OF ENGG & TECH
Sheriguda(V), Ibrahimpatnam (M), R.R. Dist-501 510

SRI INDU INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. in COMPUTER SCIENCE AND ENGINEERING (ECE)

COURSE STRUCTURE, I YEAR SYLLABUS (BR22 Regulations)

Applicable from Academic Year: 2022-23 Batch

I Year I Semester

S. No.	Course Code	Course Title	L	T	P	Credits
1.	MA101BS	Matrices and Calculus	3	1	0	4
2.	AP102BS	Applied Physics	3	1	0	4
3.	CS103ES	Programming for Problem Solving	3	0	0	3
4.	ME102ES	Engineering Workshop	0	1	3	2.5
5.	EN104HS	English for Skill Enhancement	2	0	0	2
6.	CS106ES	Elements of Computer Science & Engineering	0	0	2	1
7.	AP105BS	Applied Physics Laboratory	0	0	3	1.5
8.	CS107ES	Programming for Problem Solving Laboratory	0	0	2	1
9.	EN107HS	English Language and Communication Skills Laboratory	0	0	2	1
10.	*MC101ES	Environmental Science	3	0	0	0
11.		Induction Programme				
		Total	**14**	**3**	**12**	**20**

I Year II Semester

S. No.	Course Code	Course Title	L	T	P	Credits
1.	MA201BS	Ordinary Differential Equations and Vector Calculus	3	1	0	4
2.	CH203BS	Engineering Chemistry	3	1	0	4
3.	ME201ES	Computer Aided Engineering Graphics	1	0	4	3
4.	EE201ES	Basic Electrical Engineering	2	0	0	2
5.	EC201ES	Electronic Devices and Circuits	2	0	0	2
6.	CH206BS	Engineering Chemistry Laboratory	0	0	2	1
7.	EE202ES	Basic Electrical Engineering Laboratory	0	0	2	1
8.	CS201ES	Python Programming Laboratory	0	1	2	2
9.	CS203ES	IT Workshop	0	0	2	1
		Total	**11**	**3**	**12**	**20**

ORDINARY DIFFERENTIAL EQUATIONS AND VECTOR CALCULUS

(Course Code: MA201BS)

B.Tech. I Year II Sem.

L	T	P	C
3	1	0	4

Pre-requisites: Mathematical Knowledge at pre-university level

Course Objectives: To learn

- Methods of solving the differential equations of first and higher order.
- Concept, properties of Laplace transforms
- Solving ordinary differential equations using Laplace transforms techniques.
- The physical quantities involved in engineering field related to vector valued functions
- The basic properties of vector valued functions and their applications to line, surface andvolume integrals

Course outcomes: After learning the contents of this paper the student must be able to

- Identify whether the given differential equation of first order is exact or not
- Solve higher differential equation and apply the concept of differential equation to real worldproblems.
- Use the Laplace transforms techniques for solving ODE's.
- Evaluate the line, surface and volume integrals and converting them from one to another

UNIT-I: First Order ODE **8 L**

Exact differential equations, Equations reducible to exact differential equations, linear and Bernoulli's equations, Orthogonal Trajectories (only in Cartesian Coordinates). Applications: Newton's law of cooling, Law of natural growth and decay.

UNIT-II:Ordinary Differential Equations of Higher Order **10 L**

Second order linear differential equations with constant coefficients: Non-Homogeneous terms of the type e^{ax}, $\sin ax$, $\cos ax$, polynomials in x, $e^{ax}V(x)$ and $xV(x)$, method of variation of parameters, Equations reducible to linear ODE with constant coefficients: Legendre's equation, Cauchy-Euler equation. Applications: Electric Circuits

UNIT-III: Laplace transforms **10 L**

Laplace Transforms: Laplace Transform of standard functions, First shifting theorem, Second shifting theorem, Unit step function, Dirac delta function, Laplace transforms of functions when they are multiplied and divided by 't', Laplace transforms of derivatives and integrals of function, Evaluation of integrals by Laplace transforms, Laplace transform of periodic functions, Inverse Laplace transform by different methods, convolution theorem (without proof). Applications: solving Initial value problems by Laplace Transform method.

UNIT-IV: Vector Differentiation **10 L**

Vector point functions and scalar point functions, Gradient, Divergence and Curl, Directional derivatives, Tangent plane and normal line, Vector Identities, Scalar potential functions, Solenoidal and Irrotational vectors.

UNIT-V: Vector Integration **10 L**

Line, Surface and Volume Integrals, Theorems of Green, Gauss and Stokes (without proofs) and their applications.

TEXT BOOKS:

1. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010
2. R.K. Jain and S.R.K. Iyengar, Advanced Engineering Mathematics, Narosa Publications, 5th Edition, 2016.

REFERENCE BOOKS:

1. Erwin Kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006.
2. G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, 9th Edition, Pearson, Reprint,2002.
3. H. K. Dass and Er. Rajnish Verma, Higher Engineering Mathematics, S Chand and Company Limited, New Delhi.
4. N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications,Reprint, 2008.

SRI INDU INSTITUTE OF ENGINEERING AND TECHNOLOGY
(UGC AUTONOMOUS INSTITUTION)
Accredited by NAAC A+ Grade, Recognized under 2(f) of UGC Act 1956.
(Approved by AICTE, New Delhi and Affiliated to JNTUH, Hyderabad)
Khalsa Ibrahimpatnam, Sheriguda(V), Ibrahimpatnam(M), Ranga Reddy Dist., Telangana – 501510

Course : ODE & VC (C121) **Class: I B TECH ECE**

Course Outcomes

After completing this course the student will be able to:

C121.1 : Student can be able to find the temperature of the body by Newton's law of cooling(Remembering)

C121.2 : solve the second and higher order differential equations, find the particular integrals for the given non homogeneous differential terms (Evaluating)

C121.3 : By using concepts and formulae ,student can evaluate the Laplace Transforms to find different types of functions by using different methods.(Evaluating)

C121.4 : Explain the problems on gradient,divergent and curl of a vectors(Understanding)

C121.5 : Student can be able to select both vector and scalar point functions in vector identities(Remembering)

C121.6 :Compare the line,surface and volume integrals and apply these concepts in integral theorems(Evaluating)

CO's Mapping with PO/PSO

Mapping of course outcomes with program outcomes:

High -3 Medium -2 Low-1

PO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C121.1	3	3	-	1	1	-	-	-	-	-	-	1
C121.2	3	2	-	1	1	-	-	-	-	-	-	1
C121.3	2	3	-	1	1	-	-	-	-	-	-	1
C121.4	2	3	-	1	1	-	-	-	-	-	-	2
C121.5	3	2	-	1	1	-	-	-	-	-	-	2
C121.6	2	3	-	1	1	-	-	-	-	-	-	2
C121	2.5	2.6	-	1	1	-	-	-	-	-	-	1.5

\

CO-PO mapping Justification

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, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO4. CONDUCT INVESTIGATIONS OF COMPLEX PROBLEMS: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5. MODERN TOOL USAGE: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO12. LIFE-LONG LEARNING: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

C121.1 : Student can be able to find the temperature of the body by Newton's law of cooling (Remembering)

	Justification
PO1	Student can recognize the use of Newton's law in various examples(level 3)
PO2	Student applies the Integration concept in Newton's law of cooling. (level 3)
PO4	Student can analyze the applications of D.E and compare with real life life examples(level 1)
PO5	Student can use technical tools in solving Newton's law of cooling. (level 1)
PO12	Student can recognize the relationship between temperature and time of Newton's law in various examples(level 1)

C121.2 : solve the second and higher order differential equations find the particular integrals for the given non homogeneous differential terms (Evaluating)

	Justification
PO1	student get the knowledge of to find the solution of higher order D.E's(level 3)

PO2	Student can find the particular integrals using different types of forms(level 2)
PO4	Student can analyze non homogeneous D.E and compare with homogeneous D.E with suitable examples(level 1)
PO5	Student can select heat body materials and apply Newton's law concept in D.E(level 1)
PO12	Student can use D.E concepts in electrical circuits also(level 1)

C121.3 : evaluate the Laplace transforms and apply the concepts and formulae to find different types of functions by using different methods(Applying)

	Justification
PO1	Student get the knowledge of Laplace transform concepts and formulae and apply to get solutions of different functions (level 2)
PO 2	Student understand the concept of Laplace transform and its applications (level 3)
PO4	Student can analyse the applications of Laplace transforms and using of Differential equations(level 1)
PO5	Student can use digital tools in solving Laplace transforms first and second shifting theorems(level 1)
PO12	Student can recognize the use of convolution theorem in various examples when solving Initial value problems by Laplace Transform method. (level 1)

C121.4 : Use the Laplace transforms techniques for solving ODE's. (Applying)

	Justification
PO1	Student can identify the application of Laplace transform in Differential equations(level 2)
PO2	Student compare the different problems with different formulae in Laplace transforms and Inverse Laplace transforms (level 3)
PO4	Student can analyse the applications of Laplace transforms and using of Differential equations and using of boundary conditions(level 1)
PO5	Student can use digital tools in solving Laplace transforms for solving D.E's(level 1)
PO12	Student can recognize the use of differentiation in L.T to solve D.E in various examples(level 2)

C121.5 : Illustrate the problems on gradient,divergent and curl of a vectors(Remembering)

	Justification
PO1	Student get the concept of gradient,divergent and curl of a vector field.(level 3)

PO2	Student can solve the problems of gradient,divergent and curl of a vector (level2)
PO4	Student can analyse grad, div and curl concepts in vector integral theorems(level 1)
PO5	Student can use digital tools in solving gradient,divergent and curl of a vector field(level 1).
PO12	Student can recognize the use of divergent and curl of vectors in various examples(level 2)

C121.6 : Estimate the line, surface and volume integrals and converting them in theorems (Creating)

	Justification
PO1	Student get the knowledge surface,volume,line integral concepts (level2)
PO2	Student can differentiate the theorems using gradient,divergent and curl of the vectors (level3)
PO4	Student can analyse surface integrals can be applied in double integrals and volume integrals can be applied triple integrals(level 1)
PO5	Student can use digital tools in solving line, surface and volume integrals(level 1)
PO12	Student can recognize the conversion of line to surface ,surface to volume in vector integral theorems(level 2)

SRI INDU INSTITUTE OF ENGINEERING AND TECHNOLOGY

UGC Autonomous Institution, Accredited by NAAC with A+ Grade
Recognized under 2(f) of UGC Act 1956.
(Approved by AICTE, New Delhi and Affiliated to JNTUH, Hyderabad)
Khalsa Ibrahimpatnam, Sheriguda(V), Ibrahimpatnam(M), Ranga Reddy Dist., Telangana – 501 510
https://siiet.ac.in/

Lr. No. SIIET/BR22/Academic Calendar/2022/02 Date: 15.12.2022

REVISED ACADEMIC CALENDAR
I B.TECH FOR THE ACADEMIC YEAR 2022-23
(BR22-REGULATIONS)

Dr. I. Satyanarayana,
Principal.

X3

To,
All the HOD's
Sir,

Sub: SIIET (Autonomous)–Academic & Evaluation–Revised Academic Calendar for **I B.Tech - I & II Semesters** for the academic year 2022-2023-Reg.

****

The approved Academic Calendar for **I B.Tech – I & II Semesters** for the academic year 2022-23 is given below.

I-SEMESTER

S. NO	Description	Period		Duration
		From	To	
1.	Commencement of I Semester class work (including Induction programme)	03.11.2022		
2.	1st Spell of Instructions	03.11.2022	28.12.2022	8 Weeks
3.	I Mid Examinations	`29.12.2022	04.01.2023	1 Week
4.	Submission of First Mid Term Exam Marks to the Autonomous Section on or before	10.01.2023		
5.	2nd Spell of Instructions	05.01.2023	02.03.2023	8 Weeks
6.	Second Mid Term Examinations	03.03.2023	09.03.2023	1 Week
7.	Preparation & Practical Examinations	10.03.2023	16.03.2023	1 Week
8.	Submission of Second Mid Term Exam Marks to the Autonomous Section on or before	16.03.2023		
9.	I Semester End Examinations	17.03.2023	01.04.2023	2 Weeks

II-SEMESTER

S. NO	Description	Period		Duration
		From	To	
1.	Commencement of II Semester class work	03.04.2023		
2.	1st Spell of Instructions (including Summer Vacation)	03.04.2023	10.06.2023	10 Weeks
	Summer Vacation	15.05.2023	27.05.2023	2 Weeks
3.	I Mid Examinations	`12.06.2023	17.06.2023	1 Week
4.	Submission of First Mid Term Exam Marks to the Autonomous Section on or before	23.06.2023		
5.	2nd Spell of Instructions	19.06.2023	12.08.2023	8 Weeks
6.	II Mid Term Examinations	14.08.2023	19.08.2023	1 Week
7.	Preparation & Practical Examinations	21.08.2023	26.08.2023	1 Week
8.	Submission of Second Mid Term Exam Marks to the Autonomous Section on or before	26.08.2023		
9.	II Semester End Examinations	28.08.2023	09.09.2023	2 Weeks
Commencement of Class Work for II B.Tech I Semester – 11.09.2023				

CONTROLLER OF EXAMINATIONS
ACE
Sri Indu Institute of Engineering and Technology
(An Autonomous Institution Under JNTUH)
Sheriguda (V), Ibrahimpatnam, R.R. Dist-501510.

CONTROLLER OF EXAMINATIONS
CE
Sri Indu Institute of Engineering and Technology
(An Autonomous Institution under JNTUH)
Sheriguda (V), Ibrahimpatnam, R.R. Dist-501510.

PRINCIPAL
PRINCIPAL
Sri Indu Institute of Engineering and Technology
(An Autonomous Institution Under JNTUH)
Sheriguda (V), Ibrahimpatnam, R.R. Dist-501510.

Copy to: All the Heads of the Depts. & AO:

SRI INDU INSTITUTE OF ENGINEERING AND TECHNOLOGY

(An Autonomous Institution under UGC)

Accredited by NAAC with A+ Grade, Recognized under 2(f) of UGC Act 1956.

(Approved by AICTE, New Delhi and Affiliated to JNTUH, Hyderabad)

KhalsaIbrahimpatnam, Sheriguda(V), Ibrahimpatnam(M), Ranga Reddy Dist., Telangana – 501 510

https://siiet.ac.in/

Class: ECE **Semester: II** **W.E.F-03-04-2023** **LH:-D-209**

	I 9:40-10:30	II 10:30 - 11:20	III 11:20-12:10	12:10-12.45	IV 12.45-1.35	V 1.35-2.25	VI 2.25-3.15	VII 3.15-4.00
MON	EC	BEE	ODE	LUNCH	EDC LAB			EC(T)/ODE(T)
TUE	ODE	EC	EDC		CAEG PRACTICE			LIBRARY
WED	EC/BEE LAB				EDC	BEE	ODE	BEE(T)/EDC(T)
THU	APPLIED PYTHON LAB				ODE	BEE	EC	APPLIED PYTHON(T)
FRI	ODE	EC	EDC		EC/BEE LAB			ODE(T)/EC(T)
SAT	CAEG PRACTICE				EDC	BEE	BEE	EDC(T)/ BEE(T)

Course Code	Course Name	Name of the Faculty	Course Code	Course Name	Name of the Faculty
MA201BS	ODE-Ordinary Differential Equations & Vector Calculus	T.THIRUPATHI REDDY	**CH206BS**	**EC LAB-Engineering Chemistry Lab**	O.SHUBHASHINI/K.MOUNIKA
CH203BS	EC-Engineering Chemistry	O.SHUBHASHINI	**EE202ES**	**BEE LAB-Basic Electrical Engineering**	MP.REENA/G.BHARGAVI
ME201ES	CAEG-Computer Aided	MVB.KALYAN	**CS202ES**	**APPLIED PYTHON Programming**	B.RAJASHWARI/D.SWAPNA
EE201ES	BEE-Basic Electrical Engineering	MP.REENA	**EC202ES**	**EDC LAB-Electronic Devices & Circuits Laboratory**	G.ANUSHA/P.RAJENDRA
EC201ES	EDC-Electronic Devices & Circuits	G.ANUSHA			

Class In-Charge **Time Table Coordinator** **Head of The Department**

Sri Indu Institute of Engg. & Tech
Main Road, Sheriguda(V)
Ibrahimpatnam(M), R.R. Dist.
Telangana-501 510

Course Title	**ORDINARY DIFFERENTIAL EQUATIONS AND VECTOR CALCULUS**
Course Code	**MA201BS**
Programme	**B.Tech**
Year & Semester	**I-year II-semester**
Regulation	**BR22**
Course Faculty	**Mr.T THIRUPATHI REDDY, Assistant Professor , H&S**
sub	**LESSON PLAN**

.No	Topic	Teaching Method/Teaching Aid	No.of Sessions Planned	Reference book
1	Unitwise Introduction of Engineering mathematics-II Syllabus	Lecture Method	1	T-1,R-1
2	**UNIT –I First Order ODE** Intoduction of Ordinary D.E.	Lecture Method,web reference	1	T-1,R-1
3	Methods to solve first order D.E's(basic methods)	Lecture Method	1	T-1,R-1
4	Problems on ODE	Lecture Method/Black board	1	T-1,R-1
5	Exact D.E's and problems	Problem solving Method,video/Black board	1	T-1,R-1,V-3
6	Non exact D.E – method-I problems	Problem solving Method,video/Black board	1	T-1,R-1,V-3
7	Non exact D.E – method-II problems	Problem solving Method,video/Black board	1	T-1,T-2,V-3
8	Non exact D.E – method-III problems	Problem solving Method,video	1	T-1,R-1,V-3
9	Non exact D.E – method-IV problems	Problem solving Method,video/Black board	1	T-1,T-2,W-1,V-3
10	Linear D.E's- Problems	Lecture Method, Problem solving Method	1	T-1,R-1
11	Bernoulli's D.E- Problems	Lecture Method, Problem solving Method/Black board	1	T-1,R-1
12	Applications of D.E's – Newton's law of cooling-problems	Lecture Method, Problem solving Method	1	T-1,R-1,W-2
13	Equations of first order but not in first degree--Solvable for p - problems	Problem solving Method	1	T-1,R-2
14	Solvable for y – problems	Problem solving Method	1	T-1,R-1
15	Solvable for x- problems	Problem solving Method/Black board	1	T-1,T-2
16	**UNIT – II** **OD E's of Higher order** Introduction	Lecture Method,web reference	1	R-1,T-1,W-3
17	Second order Linear D.E's with constant coefficients	Problem solving Method		T-1,W-3
18	Complementary Functions - Problems	Problem solving Method/Black board	1	T-1,W-3
19	Particular Integral : Non homogeneous terms of the type e^{ax} ---Problems	Problem solving Method/Black board	1	R-1,W-3

20	Particular Integral : Non homogeneous terms of the type sin ax---Problems	Problem solving Method/Black board	1	T-1,W-3
21	Particular Integral : Non homogeneous terms of the type coax---Problems	Problem solving Method/Black board	1	T-1,W-3
22	Particular Integral : Non homogeneous terms of the type polynomials in x ---Problems	Problem solving Method/Black board	1	T-1,W-3
23	Particular Integral : Non homogeneous terms of the type e^{ax} V(x)---Problems	Problem solving Method	1	T-1,W-3
24	Particular Integral : Non homogeneous terms of the type xV(x)---Problems	Problem solving Method/Black board	1	T-1,T-2,R-1,W-3
25	Method of variation of parameters - Problems	Problem solving Method	1	R-1,W-3
26	Equations reducible to linear ODE with constant coefficients :Legendre's equation - Problems	Problem solving Method	1	T-1,T2,R1
27	Equations reducible to linear ODE with constant coefficients :Cauchy-Euler equation - Problems	Problem solving Method/Black board	1	T1,R-1,R2
28	Equations reducible to linear ODE with constant coefficients :Cauchy-Euler equation - Problems	Problem solving Method/Black board	1	T-1,T2,R-1
29	**UNIT –III** **Laplace transforms -Introduction**	Lecture Method	1	T-1,R-1,W-1
30	Laplace transform of standard functions	Lecture Method Problem solving Method/Black board	1	T-1,R-1,W-1
31	First shifting theorem - problems	Lecture Method	1	T-1,R-1
32	Second shifting theorem-problems	Problem solving Method/Black board	1	T-1,T2
33	Unit step function	Lecture Method	1	T-1,T-2
34	Dirac delta function	Problem solving Method	1	T-1, T-3
35	L.T.of multiplication by t	Lecture Method Problem solving Method	1	T-1,R-1
36	L.T.of division by t	Lecture Method Problem solving Method	1	T-1,T-3
37	L.T. of derivative	Lecture Method Problem solving Method	1	T-1,T-3
38	L.T.of integrals	Lecture Method Problem solving Method	1	T-1,T-3
39	Evaluation of integrals by L.T.	Lecture Method	1	T-1,T-3
40	L.T.of periodic function	Lecture Method Problem solving Method	1	T-3
41	Inverse L.T.of different methods	Lecture Method Problem solving Method	1	T-3
42	Convolution theorem – problems	Lecture Method Problem solving Method	1	T-3
43	Solving IVP by L.T. method	Lecture Method Problem solving Method	2	T-3
44	**UNIT-IV** **Vector Differentiation** Introduction	Problem solving Method	1	T-1
45	Vector point functions and scalar point functions-problems	Lecture Method,video,video	1	T-1,T-2,R-1

46	Gradient,Divergent and Curl of a vector-problems	Problem solving Method,video,video		T-1,R-1,W-4
47	Directional derivatives - Problems	Problem solving Method ,video	1	R-1,T-1
48	Tangent plane and Normal plane - problems	Lecture Method,video/Black board	1	T-1,R-1
49	Vector identities	Lecture Method,video	1	T-1,R-1
50	Scalar potential functions : Solenoidal and Irrotational vectors - problems	Problem solving Method,video	1	R-1,T-1
51	**UNIT-V** **Vector Integration** Introduction	Lecture Method	1	T-1,R-1
52	Line integrals - Problems	Lecture Method Problem solving Method,video	1	R-1,T-1,T-2
53	Surface integrals - problems	Lecture Method Problem solving Method,video/Black board	1	R-1,T-1,T-2
54	Volume integrals - problems	Lecture Method Problem solving Method,video	1	R-1,T-1,T-2,W-4
55	Green's theorem – Problems	Lecture Method Problem solving Method,video	1	R-1,T-1,T-2,W-4,V-1,V-2
56	Gauss divergence theorem - problems	Lecture Method Problem solving Method/Black board	1	R-1,T-1,T-2,V-2
57	Stokes theorem - problems	Lecture Method Problem solving Method,video/Black board	1	R-1,T-1,T-2,W-4,V-2

REFERENCES:

1. Paras Ram, Engineering Mathematics, 2nd Edition, CBS Publishes
2. S. L. Ross, Differential Equations, 3rd Ed., Wiley India, 1984.

TEXT BOOKS:

1. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010
2. Erwin kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons,2006
3. G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, 9th Edition, Pearson, Reprint, 2002.

SRI INDU INSTITUTE OF ENGINEERING AND TECHNOLOGY
(UGC AUTONOMOUS INSTITUTION)
Accredited by NAAC A+ Grade, Recognized under 2(f) of UGC Act 1956.
(Approved by AICTE, New Delhi and Affiliated to JNTUH, Hyderabad)
Khalsa Ibrahimpatnam, Sheriguda(V), Ibrahimpatnam(M), Ranga Reddy Dist., Telangana – 501510

GAP WITHIN THE SYLLABUS – MAPPING TO CO, PO

Variable-separable, Homogeneous and non homogeneous equations, Transforms of the Heaviside function and the Dirac Delta function, Flux in 3D,Basic concepts of vectors, dot product,cross product.

Course Outcomes

After completing this topic the student will be able to:

1.student can apply methods like homogeneous,variable-separable in new methods (Application)

2.after knowing dot product and cross product student can easily understand vector differentiation and integration concepts (Knowledge)

3.student can understand application of Differential equation in Laplace transform like Heaviside function ,Dirac function (Knowledge)

Mapping of course outcomes with program outcomes:

High -3 Medium -2 Low-1

PO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
1	3	2	-	-	-	-	-	-	-	-	-	-
2	2	3	-	-	-	-	-	-	-	-	-	-
3	2	2	-	-	-	-	-	-	-	-	-	-

SRI INDU INSTITUTE OF ENGINEERING AND TECHNOLOGY

(UGC AUTONOMOUS INSTITUTION)

Accredited by NAAC A+ Grade, Recognized under 2(f) of UGC Act 1956.

(Approved by AICTE, New Delhi and Affiliated to JNTUH, Hyderabad)

Khalsa Ibrahimpatnam, Sheriguda(V), Ibrahimpatnam(M), Ranga Reddy Dist., Telangana – 501510

GAP BEYOND THE SYLLABUS-MAPPING TO PO/PSO

1. Regular industrial visits help students to know the information useful for knowledge upgradation.
2. Students are encouraged to take part in Technical Quizzes and various co-curricular activities to ensure their overall development
3. Teaching at least a few portions giving practical demonstration to create interest among the students
4. Introducing current Scientific and Technological innovations and development
5. Computer aided learning tools are also used for better visual display for the Mathematics

Mapping to PO/PSO:

High -3 Medium -2 Low-1

PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
1	-	-	-	2	-	-	-	-	-		-	2
2	-	-	-	-	-	-	-	-	-	2	-	-
3	-	-	-	-	-	-	-	-	-	-	3	-
4	-	-	-	-	-	-	-	-	1	-	-	-
5	-	-	-	-	2	-	-	-	-	-	-	-

WEB REFERENCES :

w1:

https://web.uvic.ca/~tbazett/diffyqs/laplace_section.html#:~:text=The%20Laplace%20transform%20is%20a,gives%20us%20our%20desired%20solution

w-2 :

https://byjus.com/jee/newtons-law-of-cooling/#:~:text=Definition%3A%20According%20to%20Newton's%20law,the%20body%20and%20its%20surroundings.

w-3:

https://tutorial.math.lamar.edu/classes/de/IntroHigherOrder.aspx

w-4 :

https://math.gmu.edu/~rsachs/math215/textbook/Math215Ch5Sec1.pdf

VIDEO REFERENCES :

V-1 :

https://www.youtube.com/watch?v=6fJE3vvjB8o

V-2 :

https://www.youtube.com/watch?v=o2kbrqQgzOE

V-3 :

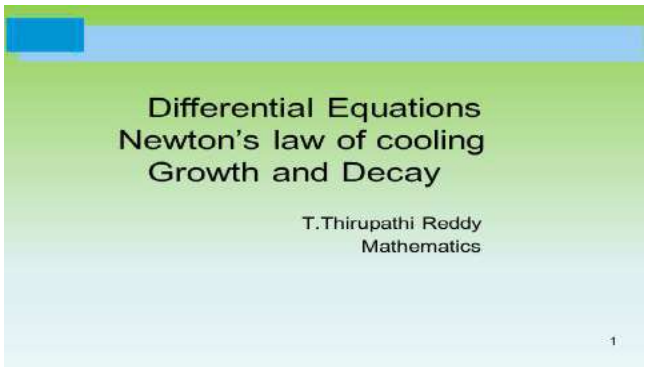
https://www.youtube.com/watch?v=Qscs_AZTf7c

SRI INDU INSTITUTE OF ENGINEERING AND TECHNOLOGY
(UGC AUTONOMOUS INSTITUTION)
Accredited by NAAC A+ Grade, Recognized under 2(f) of UGC Act 1956.
(Approved by AICTE, New Delhi and Affiliated to JNTUH, Hyderabad)
Khalsa Ibrahimpatnam, Sheriguda(V), Ibrahimpatnam(M), Ranga Reddy Dist., Telangana – 501510

ODE&VC LECTURE NOTES

https://drive.google.com/file/d/18rY8iKvmuHVpRiynxEC7HM122SEt5ZiQ/view?usp=sharing

POWERPOINT PRESENTATION



https://docs.google.com/presentation/d/1Qli9ENR_JhXzaVsV-a7lOYzOUP9XeBzn/edit?usp=sharing&ouid=109382372023570652601&rtpof=true&sd=true

https://docs.google.com/presentation/d/1-u4NggWydTzuma1C2J-i1etth0QlMyJ9/edit?usp=sharing&ouid=109382372023570652601&rtpof=true&sd=true

PREVIOUS QUESTION PAPERS

Link :

https://docs.google.com/document/d/1YwWbAYVccl7HM3QG_smcslxc6j9P8NCG/edit?usp=sharing&ouid=115477386604021184018&rtpof=true&sd=true

SRI INDU INSTITUTE OF ENGINEERING AND TECHNOLOGY

(UGC AUTONOMOUS INSTITUTE)

Accredited by NAAC A+ Grade, Recognized under 2(f) of UGC Act 1956.

(Approved by AICTE, New Delhi and Affiliated to JNTUH, Hyderabad)

Khalsa Ibrahimpatnam, Sheriguda(V), Ibrahimpatnam(M), Ranga Reddy Dist.,Telangana – 501510

I B.Tech II SEM I-Mid Examination, June-2023

BR22

Set-II

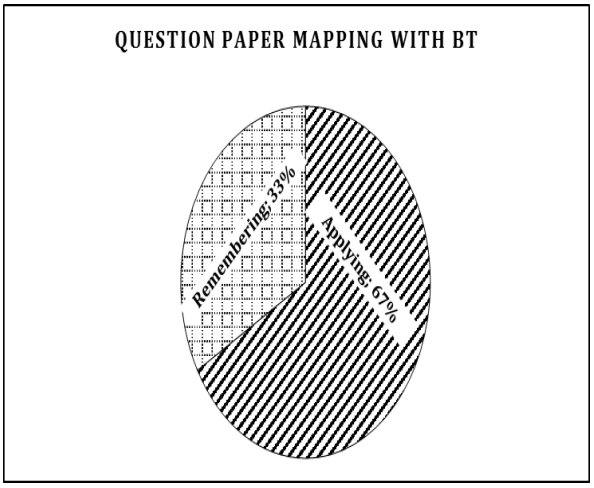
Year & Branch: ECE — Date & Session : 12-06-2023&FN

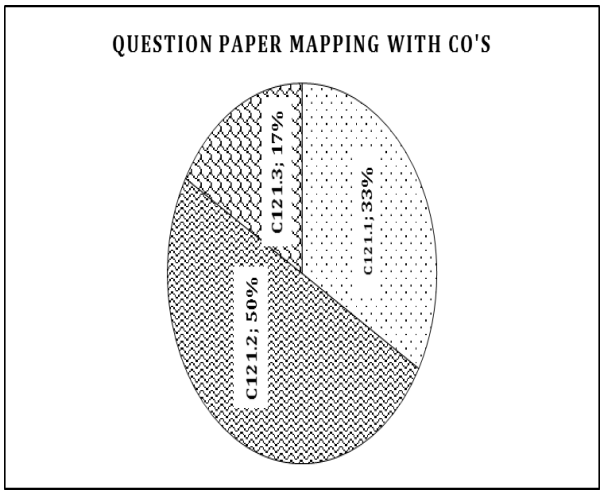
Subject : ODE&VC — Marks: 20 — Time : 2 Hours

Part-B

Answer any **FOUR** Questions. All Question Carry Equal Marks. **4*5=20 Marks**

1. Solve $(1+ y^2)dx = (\tan^{-1}y - x)dy$ **(Applying (L3))**
2. A bacterial culture growing exponentially increases from 100 to 400gms in 10hrs.How much was present after 3 hrs from the initial instant? **(Remembering(L1)**
3. Solve $y'' + 4y'+4y = 4\cos x + 3\sin x$ with $y(0)=0$, $y'(0)=0$ **(Applying (L3))**
4. Solve $\frac{d^2y}{dx^2} + y = e^{-x} + x^3 + e^x \sin x$ **(Applying (L3)**
5. Solve by the method of variation of parameters for $(D^2-2D+2)y = e^x \tan x$ **(Applying (L3)**
6. Find $L\{\cos^3 2t\}$ **(Remembering(L1))**





SRI INDU INSTITUTE OF ENGINEERING AND TECHNOLOGY

(UGC AUTONOMOUS INSTITUTION)

Accredited by NAAC A+ Grade, Recognized under 2(f) of UGC Act 1956.

(Approved by AICTE, New Delhi and Affiliated to JNTUH, Hyderabad)

Khalsa Ibrahimpatnam, Sheriguda(V), Ibrahimpatnam(M), Ranga Reddy Dist., Telangana – 501510

I B.TECH II-SEM II-MID EXAMINATIONS, August-2023 | **BR22**

Set-I

Year & Branch: ECE | Date & Session : 14-08-2023& FN

Subject : **ODE&VC** | Marks: 20 | Time : 2 Hours

Part-B

Answer any **FOUR** Questions. All Question Carry Equal Marks. **4*5=20 Marks**

1. Using convolution theorem find $L^{-1}\left\{\frac{s^2}{(s^2+4)(s^2+9)}\right\}$ **(Evaluating (L5)**

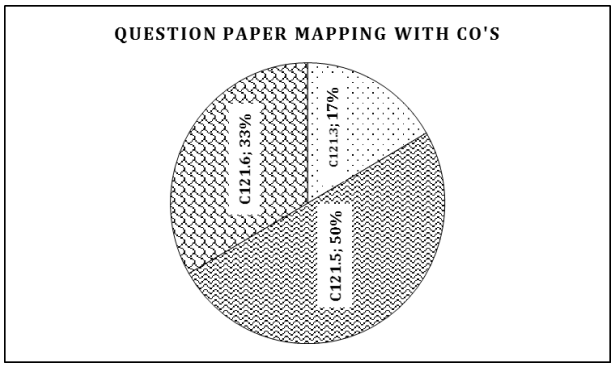
2. Find the directional derivative of $1/r$ in the direction of $\bar{r} = x\bar{\imath} + y\bar{\jmath} + z\bar{k}$ at (1,1,2) **(Remembering(L1)**)

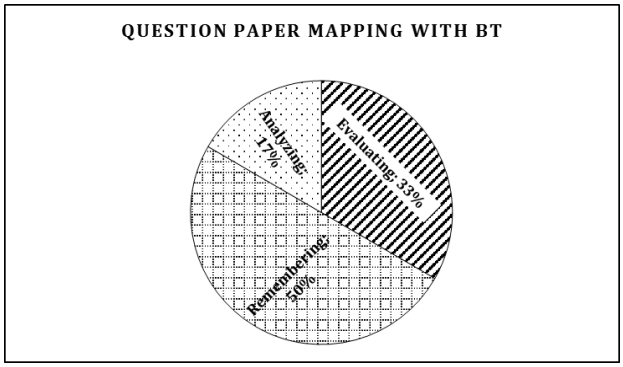
3. Prove that $\text{div}(r^n \bar{r}) = (n+3)r^n$. Hence show that $\frac{\bar{r}}{r^3}$ is solenoidal. (**Evaluating (L5))**

4. Find $(A.\nabla)\,\phi$ at (1,-1,1) if $A = 3xyz^2\bar{\imath} + 2xy^3j - x^2yzk$ and $\phi = 3x^2 - yz$**(Remembering(L1)**)

5. Find the work done by the force $\bar{F} = 3x^2i + (2xz - y)j + zk$ in moving a particle in the force field along the straight line from (0,0,0) to (2,1,3) **(Remembering(L1))**

6. Verify Gauss divergence theorem for $\bar{F} = x^3\,i + y^3j + z^3k$ taken over the cube bounded by x=0,x=a,y=0,y=a,z=0,z=a (**Analyzing(L4))**





MID I & MID-II KEY link

https://drive.google.com/file/d/1SoE19BDUBviB1sb3fTk3XVgk7NZceYKI/view?usp=sharing

MID-I & MID-II SAMPLE STUDENT SCRIPTS Link

https://drive.google.com/file/d/1w3gZCbO677r7PWXHRorVYXK_X02MG7in/view?usp=sharing

https://drive.google.com/file/d/1ke34v7zX8EX050GCscKQI5IGnie50P5u/view?usp=sharing

SRI INDU INSTITUTE OF ENGINEERING AND TECHNOLOGY

UGC Autonomous Institution, Accredited by NAAC with A+ Grade

Recognized under 2(f) of UGC Act 1956.

(Approved by AICTE, New Delhi and Affiliated to JNTUH, Hyderabad)

Sheriguda(V), Ibrahimpatnam(M), R.R Dist., Telangana – 501 510

X3

BR22

ODE & VC

I-MID ASSIGNMENT

Unit-I

1. Find a)$y(x^2y^2+2)dx + x(2-2x^2y^2)dy=0$ **(Remembering(L1)**

   b) Solve $2xydy - (x^2 - y^2 + 1)dx = 0$ **(Applying (L3))**

2. Solve a) $(1+ y^2)dx = (\tan^{-1}y - x)dy$ b) $x\frac{dy}{dx} + y = x^3y^6$ **(Applying (L3))**

3. The temperature of the body drops from 100^0C to 75^0C in 10mins when the surrounding air is at 20^0C temperature. What will be it's temperature after half an hour.When will the temperature be 25^0C. **(Remembering(L1)**

4. A bacterial culture growing exponentially increases from 100 to 400gms in 10hrs.How much was present after 3 hrs from the initial instant? **(Remembering(L1)**

5. Prove that the system of parabolas $y^2=4a(x+a)$ is self orthogonal **(Evaluating (L5))**

6. Find the orthogonal trajectories of the family of circles passing through origin and centre on x-axis. **(Remembering(L1))**

Unit-II

7. *Solve* $\frac{d^2y}{dx^2} + y = e^{-x} + x^3 + e^x \sin x$ **(Applying (L3)**

8. Solve $(D^3-7D^2+14D-8)y = e^x \cos 2x$ **(Applying (L3))**

9. Solve by the method of variation of parameters for $(D^2-2D)y = e^x \sin x$

   (Applying (L3))

10. Solve by the method of variation of parameters for $(D^2-2D+2)y = e^x \tan x$

    (Applying (L3))

Unit-III

11. Find $L\{3\cos 3t \cos 4t\}$ **(Remembering(L1))**

12. Find $L\{\cos^3 2t\}$ **(Remembering(L1))**

SRI INDU INSTITUTE OF ENGINEERING AND TECHNOLOGY

UGC Autonomous Institution, Accredited by NAAC with A+ Grade
Recognized under 2(f) of UGC Act 1956.
(Approved by AICTE, New Delhi and Affiliated to JNTUH, Hyderabad)
Sheriguda(V), Ibrahimpatnam(M), R.R Dist., Telangana – 501 510

X3

II-MID ODE&VC ASSIGNMENT

Unit-III

1. Find $L\left\{\frac{e^{-3t}sin2t}{t}\right\}$ **(Remembering(L1))**
2. Using convolution theorem find $L^{-1}\left\{\frac{s^2}{(s^2+4)(s^2+9)}\right\}$ **(Evaluating (L5)**
3. Solve the following differential equation by using Laplace transform $(D^2 + 2D + 5)y = e^{-t}sint$ given $y(0)=0$, , $y^I(0) = 1$**(Applying (L3))**

Unit-IV:

1. Prove that $div(gradr^m) = m(m+1)r^{m-2}$ **(Evaluating (L5)**
2. Prove that $\nabla(r^n) = nr^{n-2}\bar{r}$ **[Evaluating (L5)]**
3. Show that $\nabla^2[f(r)] = f^{II}(r) + \frac{2}{r}f^I(r)$ where $r = |\bar{r}|$ **(Evaluating (L5))**
4. Find the directional derivative of $1/r$ in the direction of $\bar{r} = x\bar{\imath} + y\bar{\jmath} + z\bar{k}$ at (1,1,2) **(Remembering(L1))**
5. Prove that $div(r^n\bar{r}) = (n+3)r^n$. Hence show that $\frac{\bar{r}}{r^3}$ is solenoidal.**(Evaluating (L5))**
6. a) Prove that $div(\bar{a} \times \bar{b}) = \bar{b}curl\bar{a} - \bar{a}curl\bar{b}$ **(Evaluating (L5))**

   b) Prove that $(\bar{f} \times \nabla) \times \bar{r} = -2\bar{f}$ **(Evaluating (L5))**
7. Find $(A.\nabla)\,\phi$ at (1,-1,1) if $A = 3xyz^2\bar{\imath} + 2xy^3j - x^2yzk$ and $\phi = 3x^2 - yz$**(Remembering(L1))**

Unit-V:

1. Find the work done by the force $\bar{F} = (3x^2 + 6y)i - 14yz\,j + 20xzk$ when it moves a particle from the point (0,0,0) to (1,1,1) along the curve $x=t$ $y=t^2$ and $z=t^3$ **(Remembering(L1))**
2. Evaluate $\iint \bar{F}.\bar{n}ds$ if $\bar{F} = z\bar{\imath} + x\bar{\jmath} - 3y^2z\bar{k}$ and S is the surface $x^2 + y^2 = 16$ included in the first octant between the planes $z=0$ and $z=5$ **(Evaluating (L5))**
2. Use Gauss divergence theorem to evaluate $\iint \bar{F}.\bar{n}ds$ where $\bar{F} = 4x\bar{\imath} - 2y^2\bar{\jmath} + z^2\bar{k}$ and S is the surface bounded by region $x^2 + y^2 = 4$, $z=0$ and $z=3$**(Evaluating (L5))**
3. Verify Gauss divergence theorem for $\bar{F} = x^3\,i + y^3j + z^3k$ taken over the cube bounded by $x=0, x=a, y=0, y=a, z=0, z=a$ **Analyzing(L4)**
5. Verify Green's theorem in the plane for $\int(x^2 - xy^3)dx + (y^2 - 2xy)dy$ where C is a square with vertices (0,0),(2,0),(2,2),(0,2). **Analyzing(L4)**
6. Evaluate by Green's theorem $\int(y - sinx)\,dx + cosxdy$ where C is the triangle enclosed by the lines $y=0, x = \frac{\pi}{2}$, $\pi y = 2x$ **(Evaluating (L5))**
7. Verify Stoke's theorem for $\bar{F} = (x^2 - y^2)i + 2xyj$ over the box bounded by the planes $x = 0$, $x = a$, $y = 0$, $y = b$. **Analyzing(L4)**

SRI INDU INSTITUTE OF ENGINEERING AND TECHNOLOGY
(UGC AUTONOMOUS INSTITUTION)
Accredited by NAAC A+ Grade, Recognized under 2(f) of UGC Act 1956.
(Approved by AICTE, New Delhi and Affiliated to JNTUH, Hyderabad)
Khalsa Ibrahimpatnam, Sheriguda(V), Ibrahimpatnam(M), Ranga Reddy Dist., Telangana – 501510

I-MID & II-MID ODE&VC ASSIGNMENT LINKS

I-MID link :
https://drive.google.com/file/d/1caQx6PDwD1ZrYubcRz2cF99BZolCMP33/view?usp=sharing

II-MID link:

https://drive.google.com/file/d/1AmV-gc8uP9p7XHDrHV6BVX4I1jZMWRbC/view?usp=sharing

SRI INDU INSTITUTE OF ENGINEERING AND TECHNOLOGY
(UGC AUTONOMOUS INSTITUTION)
Accredited by NAAC A+ Grade, Recognized under 2(f) of UGC Act 1956.
(Approved by AICTE, New Delhi and Affiliated to JNTUH, Hyderabad)
Khalsa Ibrahimpatnam, Sheriguda(V), Ibrahimpatnam(M), Ranga Reddy Dist., Telangana – 501510

SCHEME OF EVALUATION WITH CO and BTL MAPPING

SCHEME OF EVALUATION-MATRICES & CALCULUS(MID-I)(Set-I)

Instructions:

a) Any answer by alternate method should be valued and suitably awarded.
b) All answers (including extra, stuck off and repeated) should be valued. Answers with maximum marks must be considered.

Qn No	Description of Answer	Marks
1.	To convert into linear form (C121.1) (Analyzing)	2
1.	To convert into linear form (C121.1) (Analyzing)	2
	To find Integrating Factor (C121.1) (Analyzing)	1
	To write formula and get solution (C121.1) (Analyzing)	2
2.	To write natural growth formula (C121.1) (Analyzing)	1
	Tp collect data and calculations(C121.1) (Analyzing)	4
3.	To write the form f(D)y = Q(x) and comparing(C121.2)(Analyzing)	1
	To get complementary solution (C121.2) (Analyzing)	1
	To get Particular solution (C121.2) (Analyzing)	2
	To use boundary conditions y(0) = 0, y'(0)=0 and get solution (C121.2) (Analyzing)	1
4.	To write the form f(D)y = Q(x) and comparing(C121.2)(Analyzing)	1
	To get complementary solution (C121.2) (Analyzing)	2
	To get Particular solution and general solution(C121.2) (Analyzing)	2
5.	To compare the form with y'' + Py' + Qy = R (C121.2) (Applying)	1
	To write y_c and comparing with y_p = Au(x) + Bv(x) (C121.2) (Applying)	2
	To get A & B and writing solution (C121.2) (Applying)	2
6.	To use COS3t formula (C121.3)(Analyzing)	1
	To write Laplace transform formula (C121.3)(Analyzing)	1
	To solving and getting solution (C121.3)(Analyzing)	3
	TOTAL	**20**

SCHEME OF EVALUATION-ODE&VC (MID-II)(Set-2)

Instructions:

a) Any answer by alternate method should be valued and suitably awarded.
b) All answers (including extra, stuck off and repeated) should be valued. Answers with maximum marks must be considered.

Qn No	Description of Answer	Marks
1.	To find f(t) and g(t) C121.3) (Creating)	2
	Using convolution theorem and solving (C121.3) (Remembering)	3
2.	To write directional derivative formula along 1/r (C121.5) (Creating)	1
	To get unit normal vector e (C121.5) (Creating)	2
	To get grad(1/r) and getting directional derivative (C121.5) (Creating)	2
3.	To write relation between r and $\bar{r}$ (C121.5)(Remembering)	1
	To find div($r^n\bar{r}$) and to get $(n+3)r^n$ (C121.5)(Remembering)	2
	To show . $\bar{r}/ r^3$ is solenoidal (C121.5)(Remembering)	2
4.	To write $(A.\nabla)\ \phi$ formula (C121.6)(Remembering)	1
	To find $A.\nabla$ (C121.6)(Remembering)	1
	To find $(A.\nabla)\ \phi$ at (1,-1,1) (C121.6)(Remembering)	3
5.	To write work done formula (C121.6)((Understanding)	1
	Calculations (C121.6)((Understanding)	4
6.	To write Gauss divergence theorem formula	1
	To get L.H.S	2
	To draw cube and to get R.H.S	2
	TOTAL	**20**

TUTORIAL TOPICS

S.No	Topic	Teaching Method/Teaching Aid	No.of Sessions Planned	Reference book
1	Exact D.E's problems	Problem solving Method,video	1	R-1,T-1,V-3
2	Non exact D.E – method-I ,II,III,IV problems	Problem solving Method,video	3	R-1,T-1
3	Linear D.E's- Problems	Lecture Method, Problem solving Method/Black board	1	R-1
4	Bernoulli's D.E- Problems	Lecture Method, Problem solving Method	1	R-1
5	Applications of D.E's – Newton's law of cooling-problems	Lecture Method, Problem solving Method/Black board	1	R-1,W-2
6	Complementary Functions - Problems	Problem solving Method	1	T-1,W-3
7	Particular Integral : Non homogeneous terms of the type e^{ax},sinax,cosax,x^k, $e^{ax}V(x)$Problems	Problem solving Method	4	R-1,W-3
8	Method of variation of parameters - Problems	Problem solving Method	1	R-1,W-3
9	L.T.of periodic function	Lecture Method Problem solving Method/Black board	1	T-3,W-1
10	Inverse L.T.of different methods	Lecture Method Problem solving Method	1	T-3
11	Convolution theorem – problems	Lecture Method Problem solving Method	1	T-3
12	Solving IVP by L.T. method	Lecture Method Problem solving Method/Black board	2	T-3
13	Vector point functions and scalar point functions-problems	Lecture Method,video,video	1	R-1,V-1
14	Gradient,Divergent and Curl of a vector-problems	Problem solving Method,video,video		R-1,V-1
15	Directional derivatives - Problems	Problem solving Method ,video	1	R-1,T-1,V-1
16	Scalar potential functions : Solenoidal and Irrotational vectors - problems	Problem solving Method,video	1	R-1,T-1,V-1
17	Line integrals - Problems	Lecture Method Problem solving Method,video	1	R-1,T-1
18	Surface integrals - problems	Lecture Method Problem solving Method,video/Black board	1	R-1,T-1
19	Volume integrals - problems	Lecture Method Problem solving Method,video	1	R-1,T-1,T-2,W-4
20	Green's theorem – Problems	Lecture Method Problem solving Method,video/Black board	1	R-1,T-1,T-2,V-2
21	Gauss divergence theorem - problems	Lecture Method Problem solving Method	1	R-1,T-1,V-2

SRI INDU INSTITUTE OF ENGINEERING AND TECHNOLOGY

(UGC AUTONOMOUS INSTITUTION)

Accredited by NAAC A+ Grade, Recognized under 2(f) of UGC Act 1956.

(Approved by AICTE, New Delhi and Affiliated to JNTUH, Hyderabad)

Khalsa Ibrahimpatnam, Sheriguda(V), Ibrahimpatnam(M), Ranga Reddy Dist., Telangana – 501510

Result Analysis: I-ECE

Course Title	**ORDINARY DIFFERENTIAL EQUATIONS & VECTOR CALCULUS**
Course Code	**MA201BS**
Programme	B.Tech
Year & Semester	I-year II-semester
Regulation	BR22
Course Faculty	T Thirupathi Reddy Assistant Professor , H&S

Weak Students:

S No	Roll no	I-Sem Marks	Internal-I Status	Internal-II Status
1	22X31A0422	Failed(4 subjects)	Discontinued	Discontinued
2	22X31A0424	Failed(4 subjects)	20/35	29/40
3	22X31A0401	Failed(3 subjects)	21/35	34/40
4	22X31A0407	Failed(3 subjects)	20/35	27/40
5	22X31A0417	Failed(3 subjects)	22/35	30/40
6	22X31A0418	Failed(3 subjects)	22/30	33/40
7	22X31A0420	Failed(3 subjects)	19/35	33/40
8	22X31A0440	Failed(2 subjects)	28/30	35/40
9	22X31A0452	Failed(2 subjects)	30/35	31/40
10	22X31A0457	Failed(2 subjects)	34/35	38/40

Advanced learners:

S No	Roll No	I-Sem Marks	Gate Material
1	22X31A0402	80/100	Probability,Discrete Mathematics,Graph theory,Differential equations
2	22X31A0451	83/100	
3	22X31A0455	91/100	
4	22X31A456	81/100	
5	22X31A457	89/100	

SRI INDU INSTITUTE OF ENGINEERING AND TECHNOLOGY

(UGC AUTONOMOUS INSTITUTION)

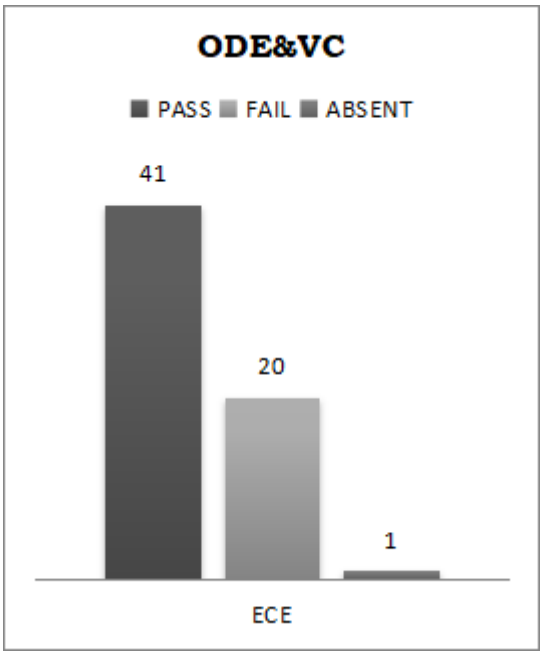
Accredited by NAAC A+ Grade, Recognized under 2(f) of UGC Act 1956.

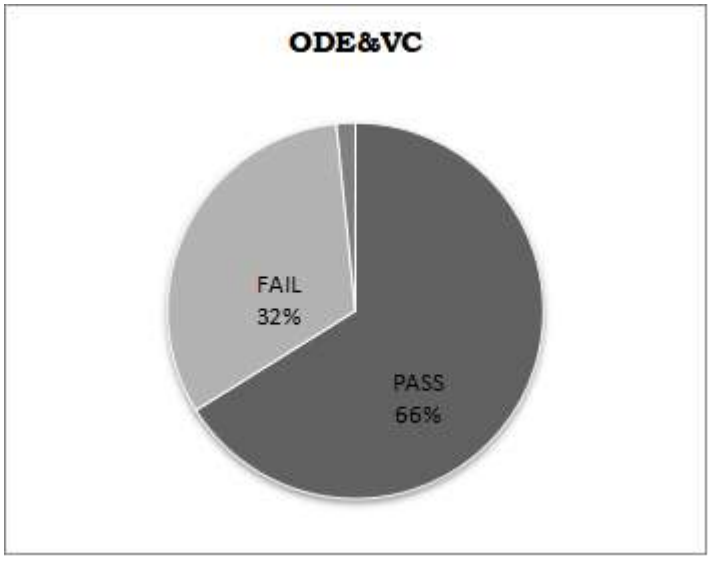
(Approved by AICTE, New Delhi and Affiliated to JNTUH, Hyderabad)

Khalsa Ibrahimpatnam, Sheriguda(V), Ibrahimpatnam(M), Ranga Reddy Dist., Telangana – 501510

RESULT ANALYSIS AT THE END OF SEMESTER

Branch: ECE **Subject: ODE&VC**





SRI INDU INSTITUTE OF ENGINEERING AND TECHNOLOGY

(UGC AUTONOMOUS INSTITUTION)

Accredited by NAAC A+ Grade, Recognized under 2(f) of UGC Act 1956.

(Approved by AICTE, New Delhi and Affiliated to JNTUH, Hyderabad)

Khalsa Ibrahimpatnam, Sheriguda(V), Ibrahimpatnam(M), Ranga Reddy Dist., Telangana – 501510

DEPARTMENT OF HUMANITIES AND SCIENCE

REMEDIAL CLASSES TIME TABLE

DAY/ PERIOD	MON 4.00-5.00	TUE 4.00-5.00	WED 4.00-5.00	THUR 4.00-5.00	FRI 4.00-5.00	SAT 4.00-5.00
CSE-A	ODE&VC	ENG	EDC	AP	ODE&VC	AP
CSE-B	AP	EDC	ODE&VC	ENG	EDC	ENG
CSE-C	ENG	AP	EDC	ODE&VC	AP	ODE&VC

DAY/ PERIOD	MON 4.00-5.00	TUE 4.00-5.00	WED 4.00-5.00	THUR 4.00-5.00	FRI 4.00-5.00	SAT 4.00-5.00
DS	EDC	AP	ODE&VC	ENG	EDC	ODE&VC
CYBER	ENG	EDC	AP	ODE&VC	AP	ENG

DAY/ PERIOD	MON 4.00-5.00	TUE 4.00-5.00	WED 4.00-5.00	THUR 4.00-5.00	FRI 4.00-5.00	SAT 4.00-5.00
AIML-A	ODE&VC	EC	EDC	BEE	EC	ODE&VC
AIML-B	BEE	EDC	ODE&VC	EC	BEE	EDC

DAY/ PERIOD	MON 4.00-5.00	TUE 4.00-5.00	WED 4.00-5.00	THUR 4.00-5.00	FRI 4.00-5.00	SAT 4.00-5.00
AI&DS	BEE	EC	ODE&VC	EDC	BEE	EC
IOT	EC	ODE&VC	EDC	BEE	ODE&VC	EDC

DAY/ PERIOD	MON 4.00-5.00	TUE 4.00-5.00	WED 4.00-5.00	THUR 4.00-5.00	FRI 4.00-5.00	SAT 4.00-5.00
ECE	ODE&VC	BEE	EC	EDC	BEE	EC
CIVIL	ODE&VC	BEE	EC	AM	BEE	EC

Head of the Department
Department of H&S
SRI INDU INSTITUTE OF ENGG & TECH
Sheriguda(V), Ibrahimpatnam (M), R.R. Dist-501 510

PRINCIPAL
Sri Indu Institute of Engineering & Tech.
Sheriguda(Vill), Ibrahimpatnam
R.R. Dist. Telangana-501 510.

SRI INDU INSTITUTE OF ENGINEERING AND TECHNOLOGY

Department of Humanities & Sciences

Course Outcome Attainment (Internal Examination-1)

Name of the facu	T THIRUPATHI REDDY	Academic Year:	2022-2023
Branch & Sectior	ECE	Examination:	I Internal
Course Name:	ODE&VC	Year: I	Semester: II

S.No	HT No.	Q1a	Q1b	Q1c	Q2a	Q2b	Q2c	Q3a	Q3b	Q3c	Q4a	Q4b	Q4c	Q5a	Q5b	Q5c	Q6a	Q6b	Q6c	Obj1	A1
Max. Marks ==>		5			5			5			5			5			5			10	5
1	22X31A0401	1			1			1									5			8	5
2	22X31A0402	5									5			5			5			10	5
3	22X31A0403	4			1			1									1			7	5
4	22X31A0404				2			0			2						5			8	5
5	22X31A0405	5			5						2						5			10	5
6	22X31A0406	5									5			5			5			8	5
7	22X31A0407	2			1									2						10	5
8	22X31A0408	5			5						5						5			9	5
9	22X31A0409	5									5			5			5			9	5
10	22X31A0410	5			4						5						5			8	5
11	22X31A0411	5			4						5			5						7	5
12	22X31A0412	5			4									4			5			8	5
13	22X31A0413				4						5			5			5			8	5
14	22X31A0414	5									5			5			5			10	5
15	22X31A0415	5									5			5			5			7	5
16	22X31A0416	3			3						5						5			5	5
17	22X31A0417	1									3			1			2			10	5
18	22X31A0418				1						1						5			10	5
19	22X31A0419	1			4						5						5			9	5
20	22X31A0420	5			1			2						1						5	5
21	22X31A0421	5			4						5						5			8	5
22	22X31A0422																				5
23	22X31A0423	5			4						4						4			8	5
24	22X31A0424	1			1						1						5			7	5
25	22X31A0425	5			2						5						5			8	5
26	22X31A0426	5			5						5						5			7	5
27	22X31A0427	5			4						5						5			9	5
28	22X31A0428	5									5			5			5			10	5
29	22X31A0429	5			5									5			5			10	5
30	22X31A0430				5									2			2			9	5
31	22X31A0431				2												5			9	5
32	22X31A0432	2			5									3			5			9	5
33	22X31A0433				5						5			5			5			9	5
34	22X31A0434	5									5			5			5			10	5
35	22X31A0435	5			4									0						9	5
36	22X31A0436				5									2			5			8	5
37	22X31A0437																				5
38	22X31A0438	2			4															9	5
39	22X31A0439	3			4									5			5			10	5
40	22X31A0440	5			5									5			2			6	5
41	22X31A0441	5									5			5			5			10	5
42	22X31A0442				4						5			1			5			9	5
43	22X31A0443				5			1			2						5			6	5
44	22X31A0444	1			1									5						7	5
45	22X31A0445				3						1			1			5			7	5
46	22X31A0446	1			3									0			5			9	5
47	22X31A0447	5			5									5			5			9	5
48	22X31A0448	5			5			5						3						7	5
49	22X31A0449	5			5									5			5			10	5
50	22X31A0450	3			5						5			5						8	5
51	22X31A0451	0			3									2			0			9	5
52	22X31A0452	5			5						0						5			10	5
53	22X31A0453	5			5						5						5			10	5
54	22X31A0454	5			5						5			5						6	5
55	22X31A0455	5									5			5			5			10	5
56	22X31A0456	5												5			5			8	5
57	22X31A0457	5			5						5						5			9	5
58	22X31A0458				5						5			5			5			10	5
59	22X31A0459				5						5			5			5			10	5
60	22X31A0460	5			5						5									7	5
61	22X31A0461	5			5						5						5			7	5
62	22X31A0462	3			5									4			5			6	5
63	22X31A0463	5			5									5			5			10	5
64	22X31A0464	2						3			0			0						9	5

Target set by the faculty / HoD	3.00	0.00	0.00	3.00	0.00	0.00	3.00	0.00	0.00	3.00	0.00	0.00	3.00	0.00	0.00	3.00	0.00	0.00	6.00	3.00
students performed above the target	39	0	0	40	0	0	2	0	0	31	0	0	28	0	0	46	0	0	60	64
Number of students attempted	50	0	0	50	0	0	7	0	0	39	0	0	39	0	0	51	0	0	62	64
Percentage of students scored more than target	78%			80%			29%			79%			72%			90%			97%	100%

CO Mapping with Exam Questions:

CO - 1	Y			Y														Y	Y
CO - 2							Y			Y						Y			Y	Y
CO - 3													Y						Y	Y
CO - 4																				
CO - 5																				
CO - 6																				

Scored >Target %	78%			80%			29%			79%			72%			90%			97%	100%

CO Attainment based on Exam Questions:

CO - 1	78%			80%														97%	100%
CO - 2							29%			29%						29%			97%	100%
CO - 3													29%						97%	100%
CO - 4																				
CO - 5																				
CO - 6																				

CO	Subj	obj		Asgn	Overall	Level
CO-1	79%	88%		100%	89%	3.00
CO-2	29%	46%		100%	58%	3.00
CO-3	29%	63%		100%	64%	3.00
CO-4						
CO-5						
CO-6						

tainment Le	
1	40%
2	50%
3	60%

Attainment (Internal 1 Examinatior 3.00

SRI INDU INSTITUTE OF ENGINEERING AND TECHNOLOGY

Department of Humanities & Sciences

Course Outcome Attainment (Internal Examination-2)

Name of the faculty: T THIRUPATHI REDDY | Academic Year: 2022-2023

Branch & Section: ECE | Examination: II Internal

Course Name: ODE&VC | Year: I | Semester: II

S.No	HT No.	Q1a	Q1b	Q1c	Q2a	Q2b	Q2c	Q3a	Q3b	Q3c	Q4a	Q4b	Q4c	Q5a	Q5b	Q5c	Q6a	Q6b	Q6c	Obj	A2	viva/ ppt
Max. Marks ==>		5			5			5			5			5			5			10	5	5
1	22X31A0401	5			5						5						5			9	5	5
2	22X31A0402							5			5			5			5			9	4	5
3	22X31A0403							5			5			5			5			9	5	5
4	22X31A0404				5			5			5			5						9	5	5
5	22X31A0405				5			4			5						5			9	5	5
6	22X31A0406				5			5			5						5			9	5	5
7	22X31A0407	3			5			5												9	5	5
8	22X31A0408				5			3			5						5			9	5	5
9	22X31A0409	5			5						5						5			10	5	5
10	22X31A0410	5			5			5			5									9	5	5
11	22X31A0411	5			5			5			5									10	5	5
12	22X31A0412	5			5			5			5									9	5	5
13	22X31A0413	5						5			5						5			8	5	5
14	22X31A0414	5			5			5			5									10	5	5
15	22X31A0415	5			5			5			5									8	3	5
16	22X31A0416	4			5			5			5									8	5	5
17	22X31A0417	5						5			5						5			7	3	5
18	22X31A0418	5						5			5						5			8	5	5
19	22X31A0419	5			5			5			5									6	5	5
20	22X31A0420	5			5			5			5									8	5	5
21	22X31A0421	5						0			5									7	5	5
22	22X31A0422																					5
23	22X31A0423																					5
24	22X31A0424	4			5			5			5									8	2	5
25	22X31A0425	2									5						5			5	5	5
26	22X31A0426				5			5			5						5			8	5	5
27	22X31A0427	3			4						5						5			9	5	5
28	22X31A0428	5																		9	5	5
29	22X31A0429																					5
30	22X31A0430	4															4			7	2	5
31	22X31A0431	3																		9	4	5
32	22X31A0432	2									5						5			8	5	5
33	22X31A0433	5						5			5						5			10	5	5
34	22X31A0434	5			5			5									5			10	5	5
35	22X31A0435	3			1						5									8	5	5
36	22X31A0436																				4	5
37	22X31A0437																					5
38	22X31A0438																					5
39	22X31A0439	5						5			5						5			8	5	5
40	22X31A0440				5			5			5						5			8	2	5
41	22X31A0441	5			5			5			5									10	5	5
42	22X31A0442	5			5			5			5									8	5	5
43	22X31A0443				3			5									5			7	5	5
44	22X31A0444				1			1			5						1			7	5	5
45	22X31A0445				5			5			5						5			8	5	5
46	22X31A0446	1			4						5						3			7	5	5
47	22X31A0447	5						1			5			5						7	5	5
48	22X31A0448	5						5			5						3			7	5	5
49	22X31A0449				5			5			5						5			7	5	5
50	22X31A0450				5			5			5						5			10	5	5
51	22X31A0451	5						5			5						3			9	5	5
52	22X31A0452	5			4						5									9	3	5
53	22X31A0453	5			5			5			5									9	5	5
54	22X31A0454				5			5			5									7	5	5
55	22X31A0455	5			5			5						5						10	5	5
56	22X31A0456	0			5												2			9	5	5
57	22X31A0457	5			5			5			5									8	5	5
58	22X31A0458	5			5			5			5									8	5	5
59	22X31A0459	5						5			5						5			8	5	5
60	22X31A0460	5			5						5						5			8	5	5
61	22X31A0461	5			1						5						5			8	5	5
62	22X31A0462	5			5			5			5									8	5	5
63	22X31A0463	5			5			5												8	5	5
64	22X31A0464	5			4						5									8	4	5

Target set by the faculty / HoD	3.00	0.00	0.00	3.00	0.00	0.00	3.00	0.00	0.00	3.00	0.00	0.00	3.00	0.00	0.00	3.00	0.00	0.00	6.00	3.00	3.00
Number of students performed above the target	40	0	0	38	0	0	40	0	0	49	0	0	5	0	0	29	0	0	57	56	64
Number of students attempted	44	0	0	41	0	0	43	0	0	49	0	0	5	0	0	31	0	0	58	59	64
Percentage of students scored more than target	91%			93%			93%			100%			100%			94%			98%	95%	100%

CO Mapping with Exam Questions:

CO - 1																				
CO - 2																				
CO - 3	Y																	Y	Y	Y
CO - 4							Y											Y	Y	Y
CO - 5										Y			Y					Y	Y	Y
CO - 6				Y												Y		Y	Y	Y

% Students Scored >Target %	91%			93%			93%			100%			100%			94%			98%	95%	100%

CO Attainment based on Exam Questions:

CO - 1																				
CO - 2																				
CO - 3	91%																	98%	95%	95%
CO - 4							91%											98%	95%	95%
CO - 5										91%			91%					98%	95%	95%
CO - 6				91%												91%		98%	95%	100%

CO	Subj	obj	aasg	ppt	Overall	Level
CO-1						
CO-2						
CO-3	91%	98%	95%	95%	95%	3
CO-4	91%	98%	95%	95%	95%	3.00
CO-5	91%	98%	95%	95%	95%	3.00
CO-6	91%	98%	95%	100%	96%	3.00

Attainment (Internal Examination-2) 3.00

Attainment Level	
1	40%
2	50%
3	60%

SRI INDU INSTITUTE OF ENGINEERING AND TECHNOLOGY

Department of Humanities & Sciences

Course Outcome Attainment (University Examinations)

Name of the faculty	T THIRUPATHI REDDY	Academic Year:	2022-2023
Branch & Section:	ECE	Year / Semester:	I / II
Course Name:	ODE&VC		

S.No	Roll Number	Marks Secured		S.No	Roll Number	Marks Secured
1	22X31A0401	22		36	22X31A0436	25
2	22X31A0402	41		37	22X31A0437	
3	22X31A0403	44		38	22X31A0438	
4	22X31A0404	21		39	22X31A0439	13
5	22X31A0405	28		40	22X31A0440	24
6	22X31A0406	24		41	22X31A0441	26
7	22X31A0407	13		42	22X31A0442	11
8	22X31A0408	32		43	22X31A0443	27
9	22X31A0409	24		44	22X31A0444	5
10	22X31A0410	24		45	22X31A0445	11
11	22X31A0411	5		46	22X31A0446	25
12	22X31A0412	29		47	22X31A0447	4
13	22X31A0413	11		48	22X31A0448	4
14	22X31A0414	21		49	22X31A0449	17
15	22X31A0415	23		50	22X31A0450	21
16	22X31A0416	12		51	22X31A0451	52
17	22X31A0417	16		52	22X31A0452	46
18	22X31A0418	21		53	22X31A0453	40
19	22X31A0419	27		54	22X31A0454	39
20	22X31A0420	2		55	22X31A0455	51
21	22X31A0421	11		56	22X31A0456	51
22	22X31A0422			57	22X31A0457	50
23	22X31A0423	21		58	22X31A0458	31
24	22X31A0424	3		59	22X31A0459	35
25	22X31A0425	9		60	22X31A0460	21
26	22X31A0426	33		61	22X31A0461	31
27	22X31A0427	21		62	22X31A0462	43
28	22X31A0428	21		63	22X31A0463	34
29	22X31A0429	16		64	22X31A0464	21
30	22X31A0430	5		65		
31	22X31A0431	2		66		
32	22X31A0432	17		67		
33	22X31A0433	22		68		
34	22X31A0434	25		69		
35	22X31A0435	35		70		
Max Marks		60				

Class Average mark	24		Attainment Level	% students
Number of students performed above the target	29		1	40%
Number of successful students	61		2	50%
Percentage of students scored more than target	48%		3	60%
Attainment level	2			

SRI INDU INSTITUTE OF ENGINEERING AND TECHNOLOGY

Department of Humanities & Sciences

Course Outcome Attainment

Name of the faculty	T THIRUPATHI REDDY	Academic Year	2022-2023
Branch & Section:	ECE	Examination:	II Internal
Course Name:	ODE&VC	Year:	I
		Semester:	II

Course Outcomes	1st Internal Exam	2nd Internal Exam	Internal Exam	University Exam	Attainment Level
CO1	3.00		3.00	2.00	2.30
CO2	3.00		3.00	2.00	2.30
CO3	3.00	3.00	3.00	2.00	2.30
CO4		3.00	3.00	2.00	2.30
CO5		3.00	3.00	2.00	2.30
CO6		3.00	3.00	2.00	2.30
Internal & University Attainment:			3.00	2.00	
Weightage			30%	70%	
CO Attainment for the course (Internal, University)			0.90	1.40	
CO Attainment for the course (Direct Method)			2.30		

Overall course attainment level 2.30

SRI INDU INSTITUTE OF ENGINEERING & TECHNOLOGY

Department of Humanities & Sciences

Program Outcome Attainment (from Course)

Name of Faculty:	T THIRUPATHI REDDY	Academic Year:	2022-2023
Branch & Section:	ECE	Year:	I
Course Name:	ODE&VC	Semester:	II

CO-PO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	-	1	1	-	-	-	-	-	-	1
CO2	3	2	-	1	1	-	-	-	-	-	-	1
CO3	2	3	-	1	1	-	-	-	-	-	-	1
CO4	2	3	-	1	1	-	-	-	-	-	-	2
CO5	3	2	-	1	1	-	-	-	-	-	-	2
CO6	2	3	-	1	1	-	-	-	-	-	-	2
Course	**2.5**	**2.6**	-	1	1	-	-	-	-	-	-	1.5

CO	**Course Outcome Attainment**
CO1	2.30
CO2	2.30
CO3	2.30
CO4	2.30
CO5	2.30
CO6	2.30
Overall course attainment level	**2.30**

PO-ATTAINMENT

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO Attainment	**1.53**	**1.66**										

CO contribution to PO - 33%, 67%, 100% (Level 1/2/3)

ATTENDANCE REGISTER

Link

https://drive.google.com/file/d/1bznSaEDajdCkqzZ-8ByTxoGjSKbN1_kF/view?usp=sharing