COURSE FILE

ON

ORDINARY DIFFERENTIAL EQUATIONS & VECTOR CALCULUS

Course Code – MA201BS

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

Prepared by

Mrs.V.Sujatha,
Assistant 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.

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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.

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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 synthesisof 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 ina 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

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SRI INDU INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. in Artificial Intelegence and Data Science

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.

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

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

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)

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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

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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)

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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.

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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				

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

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Class: AI &DS **Semester: II** **W.E.F-03-04-2023** **LH:-D-210**

	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	CAEG PRACTICE			LUNCH	EC	BEE	EDC	LIBRARY
TUE	EC/BEE LAB				ODE	EC	BEE	BEE(T)/EDC(T)
WED	ITWS LAB				ODE	EDC	BEE	PYTHON(T)
THU	ODE	EC	EDC		EC/BEE LAB			ODE(T)/EC(T)
FRI	BEE	ODE	ODE		CAEG PRACTICE			EDC(T)/ BEE(T)
SAT	EDC	EC	BEE		PYTHON LAB			EC(T)/ODE(T)

Course Code	Course Name	Name of the Faculty	Course Code	Course Name	Name of the Faculty
MA201BS	ODE-Ordinary Differential Equations & Vector Calculus	V.SUJATHA	CH206BS	EC LAB-Engineering Chemistry Laboratory	K.MOUNIKA/V.MOUNIKA
CH203BS	EC-Engineering Chemistry	K.MOUNIKA	EE202ES	BEE LAB-Basic Electrical Engineering Laboratory	G.BHARGAVI/K.RAJASHEKAR
ME201ES	CAEG-Computer Aided Engineering Graphics	A.MALLESH	CS201ES	PYTHON Programming Laboratory	M.TEJASWI/ P.BALU
EE201ES	BEE-Basic Electrical Engineering	G.BHARGAVI	CS203ES	ITWS-IT Workshop	N.KEERTHI CHANDANA/B.SWATHI
EC201ES	EDC-Electronic Devices & Circuits	P.SRILATHA			

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

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Course Title	**ORDINARY DIFFERENTIAL EQUATIONS AND VECTOR CALCULUS**
Course Code	**MA201BS**
Programme	**I-B.Tech AI&DS**
Year & Semester	**I-year II-semester**
Regulation	**BR22**
Course Faculty	**Mrs.V.Sujatha, 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,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.

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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	-	-	-	-	-	-	-	-	-	-

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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

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ODE&VC LECTURE NOTES

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

POWERPOINT PRESENTATION

1.Ordinary Differential Equations of First Order and First Degree

https://docs.google.com/presentation/d/1qdDbxZvco17Uuw9-TQQUE7yGzTXkYYsS/edit?usp=sharing&ouid=106039517343501825239&rtpof=true&sd=true

2. Newtons Law of Cooling

https://docs.google.com/presentation/d/1YXzJKu99wG9acUS1u17oe1LX9ueApUch/edit?usp=sharing&ouid=106039517343501825239&rtpof=true&sd=true

3. Laplace Transform

https://docs.google.com/presentation/d/1w4WySkvmtlzyJoupQXCW4Btt_pZ4dkAU/edit?usp=sharing&ouid=106039517343501825239&rtpof=true&sd=true

4.Vector Differentiation

https://docs.google.com/presentation/d/1BtBca2dXCkIT-ea0s5jJ0OCo0RGPlLXq/edit?usp=sharing&ouid=106039517343501825239&rtpof=true&sd=true

5.Greens Theorem

https://docs.google.com/presentation/d/1Dzmn7ftUw33ucBmtf35-TlPYLjmtI7XK/edit?usp=sharing&ouid=106039517343501825239&rtpof=true&sd=true

PREVIOUS QUESTION PAPERS

Link :

https://docs.google.com/document/d/1YwWbAYVccl7HM3OG_smcslxc6j9P8NCG/edit?usp=sharing&ouid=115477386604021184018&rtpof=true&sd=true

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

BR22

Set-II

Year & Branch: AI&DS — 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))**

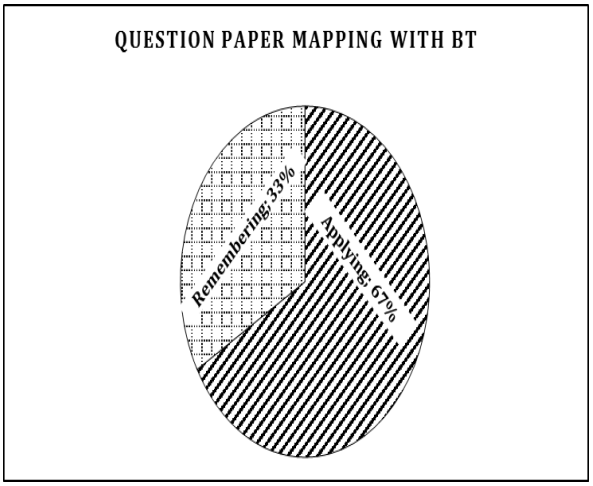
2. A bacterial culture growing exponentially increases from 100 to 400gms in 10hrs.How much was present after 3 hrs from the initial instant? **(Remembering(L1)**

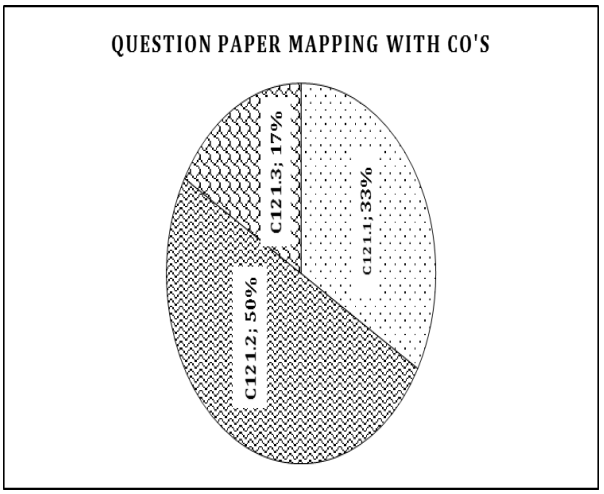
3. Solve $y'' + 4y'+4y = 4\cos x + 3\sin x$ with $y(0)=0$, $y'(0)=0$ **(Applying (L3))**

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))**





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

Set-I

Year & Branch: AI&DS 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)**

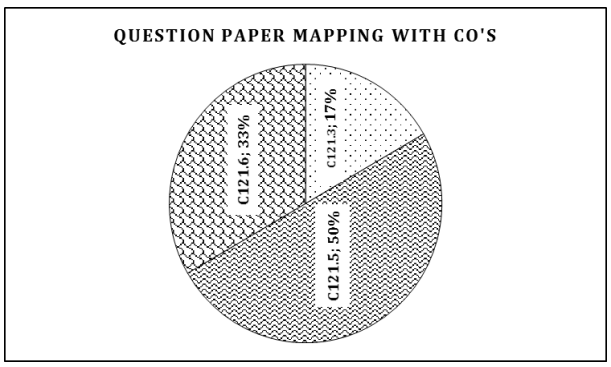
2. Find the directional derivative of 1/r in the direction of $\bar{r} = x\bar{\imath} + y\bar{\jmath} + z\bar{k}$ at (1,1,2) **(Remembering(L1)**)

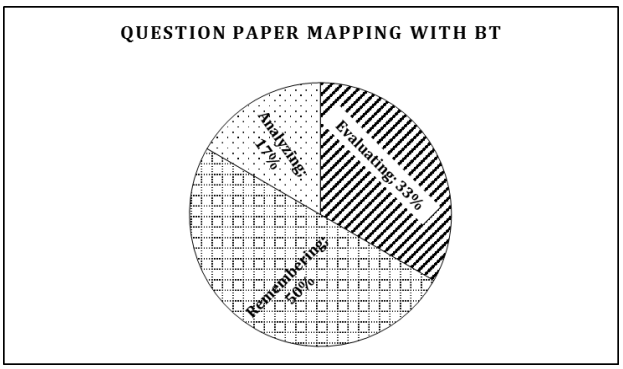
3. Prove that div$(r^n \bar{r})$ = (n+3)r^n. Hence show that $\frac{\bar{r}}{r^3}$ is solenoidal. **(Evaluating (L5))**

4. Find (A. ∇) ϕ 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 $\bar{F}$ = $x^3 i + y^3 j + z^3 k$ 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

https://drive.google.com/file/d/1eN4juuOf9RJfEv4youhPCCEcfTAy3f6-/view?usp=sharing

MID-I & MID-II SAMPLE STUDENT SCRIPTS Link

https://drive.google.com/file/d/1rcrEGQ0_epHyQ2kyupZA7WcKqt_A2kT0/view?usp=sharing

https://drive.google.com/file/d/1inMr5bprS7TUi8qYiO6tylLd9dLNrtAx/view?usp=sharing

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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{3cos3tcos4t} **(Remembering(L1))**

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

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 $(D^2 + 2D + 5)y = e^{-t}\sin t$ given $y(0)=0, , y^I(0) = 1$**(Applying (L3))**

Unit-IV:

1. Prove that $div(grad r^m) = m(m+1)r^{m-2}$ **(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 $\int(y - sinx)\,dx + cosx\,dy$ 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)**

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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/1o8eqIIRPtPNoW21FGYdHx_d5cSF_Y3VB/view?usp=sharing

II- MID link:
https://drive.google.com/file/d/1ewBvXSjJtRNyfv_vjxb9gp93YcqGlj2d/view?usp=sharing

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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 $\vec{r}$ (C121.5)(Remembering)	1
	To find div($r^n\vec{r}$) and to get $(n+3)r^n$ (C121.5)(Remembering)	2
	To show . $\vec{r}$ 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

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Result Analysis: I-AI&DS

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

Weak Students:

S No	Roll no	I-Sem Marks	Internal-I Status	Internal-II Status
1	22X31A7214	13	27/35	10/40
2	22X31A7216	10	29/35	29/40
3	22X31A7230	11	26/35	28/40
4	22X31A7238	12	28/35	31/40
5	22X31A7240	0	26/35	10/40
6	22X31A7246	7	29/35	33/40
7	22X31A7247	14	27/35	10/40
8	22X31A7254	6	29/35	39/40
9	22X31A7256	16	29/35	31/40
10	22X31A7263	5	5/35	28/40
11	22X31A7264	4	28/35	25/40

Advanced learners:

S No	Roll No	I-Sem Marks	Gate Material
1	22X31A7226	83/100	Probability,Discrete Mathematics,Graph theory,Differential equations
2	22X31A7237	85/100	
3	22X31A7257	85/100	
4	22X31A7259	86/100	
5	22X31A7260	83/100	

SRI INDU INSTITUTE OF ENGINEERING AND TECHNOLOGY

(UGC AUTONOMOUS INSTITUTION)

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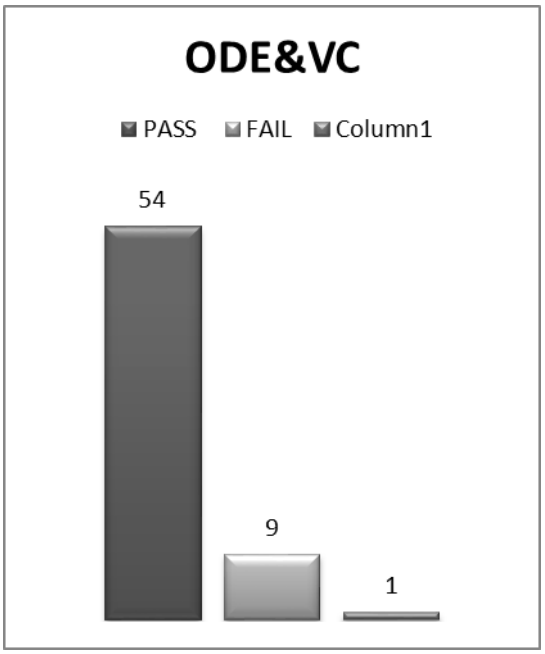
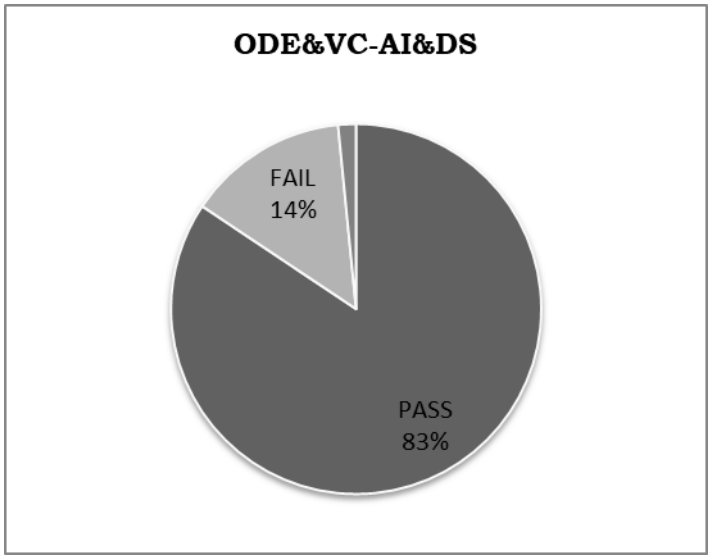
(Approved by AICTE, New Delhi and Affiliated to JNTUH, Hyderabad)

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

RESULT ANALYSIS AT THE END OF SEMESTER

Branch: AI&DS **Subject: ODE&VC**





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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 facult	V.SUJATHA	Academic Year:	2022-2023
Branch & Section:	AI&DS	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	22X31A7201				5						5			5			5			10	**5**
2	22X31A7202	5			5						5						5			8	**5**
3	22X31A7203				5						5			5			5			10	**5**
4	22X31A7204	A			A			A			A			A			A			A	**5**
5	22X31A7205				5						5			5			5			9	**5**
6	22X31A7206	2			5												5			9	**5**
7	22X31A7207	4			5												5			8	**5**
8	22X31A7208	5			5						5			2						9	**5**
9	22X31A7209	A			A			A			A			A			A			A	**5**
10	22X31A7210				5						5			5			5			10	**5**
11	22X31A7211	5			5									1			5			10	**5**
12	22X31A7212	5			5												4			9	**5**
13	22X31A7213	5			5									1			5			9	**5**
14	22X31A7214	5			3												5			9	**5**
15	22X31A7215	5									5			5			5			10	**5**
16	22X31A7216				4						5						5			10	**5**
17	22X31A7217	5									5			4			5			10	**5**
18	22X31A7218	5			5												5			9	**5**
19	22X31A7219	5			5						5						5			10	**5**
20	22X31A7220	5			5						5						5			10	**5**
21	22X31A7221	5			5						5						4			9	**5**
22	22X31A7222	5			5									3			5			10	**5**
23	22X31A7223	5			4									5			5			10	**5**
24	22X31A7224				5						5			5			5			10	**5**
25	22X31A7225	5			5									2			5			10	**5**
26	22X31A7226				5						5			5			5			10	**5**
27	22X31A7227	5			5						5			5						10	**5**
28	22X31A7228				5									3			5			9	**5**
29	22X31A7229				5						5			5			5			10	**5**
30	22X31A7230	2			5												5			9	**5**
31	22X31A7231				5			4			4						5			10	**5**
32	22X31A7232	5			5									2			5			9	**5**
33	22X31A7233	5			5						5			5			5			10	**5**
34	22X31A7234				5						5			5			5			10	**5**
35	22X31A7235				5						5			5			5			10	**5**
36	22X31A7236	5			5						5			5						10	**5**
37	22X31A7237	5			3									5			5			10	**5**
38	22X31A7238	2			5						3			5						8	**5**
39	22X31A7239	5			5												5			10	**5**
40	22X31A7240	3			5												5			8	**5**
41	22X31A7241	2			4									5			5			10	**5**
42	22X31A7242	5			5						5			5						10	**5**
43	22X31A7243				5						5			3			5			9	**5**
44	22X31A7244	5			5			2									5			9	**5**
45	22X31A7245	5			5						5						5			10	**5**
46	22X31A7246	5			5												5			9	**5**
47	22X31A7247	3			5												5			9	**5**
48	22X31A7248	5			5						5			5						10	**5**
49	22X31A7249	5			5						5						5			10	**5**
50	22X31A7250	4			4						5			5						10	**5**
51	22X31A7251				5						5						5			9	**5**
52	22X31A7252	5									5			5			5			10	**5**
53	22X31A7253	5			5						5			5						9	**5**
54	22X31A7254	5			5									1			5			8	**5**
55	22X31A7255				3						3			3			5			10	**5**
56	22X31A7256	5			3						1						5			10	**5**
57	22X31A7257	5			5						5			5						10	**5**
58	22X31A7258	5									5			3						9	**5**
59	22X31A7259	5			5						5						5			10	**5**
60	22X31A7260	5			5						5			5						10	**5**
61	22X31A7261	5			5						5			5						10	**5**
62	22X31A7262	5			5									5			5			10	**5**
63	22X31A7263	A			A			A			A			A			A			A	**5**
64	22X31A7264	5			3						1						5			9	**5**

Target set by the faculty / HoD	3.00	0.00	0.00	3.00	0.00	0.00	3.00		0.00	3.00	0.00	0.00	3.00	0.00	0.00	3.00	0.00	0.00	6.00	3.00
Number of students performed above the target	42	0	0	57	0	0	1	0	0	37	0	0	32	0	0	49	0	0	61	64
Number of students attempted	49	0	0	60	0	0	5	0	0	42	0	0	41	0	0	52	0	0	64	64
Percentage of students scored more than target	86%			95%			20%			88%			78%			94%			95%	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																				

>Target %	86%			95%			20%			88%			78%			94%			95%	100%

CO Attainment based on Exam Questions:

CO - 1	86%			95%														95%	100%
CO - 2							20%			20%						20%			95%	100%
CO - 3													20%						95%	100%
CO - 4																				
CO - 5																				
CO - 6																				

CO	**Subj**	obj		Asgn	Overall	Level
CO-1	90%	95%		100%	95%	3.00
CO-2	20%	39%		100%	53%	3.00
CO-3	20%	58%		100%	59%	3.00
CO-4						
CO-5						
CO-6						

Attainment Level	
1	40%
2	50%
3	60%

Attainment (Internal 1 Examination) **3.00**

SRI INDU INSTITUTE OF ENGINEERING AND TECHNOLOGY

Department of Humanities & Sciences

Course Outcome Attainment (Internal Examination-2)

Name of the faculty: V.SUJATHA | Academic Year: 2022-2023

Branch & Section: AI&DS | 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	22X31A7201	5			5						5			5						10	5	**5**
2	22X31A7202	5			5			5			5									9	5	**5**
3	22X31A7203	5			5			5									5			10	5	**5**
4	22X31A7204	5			5			4			5									9	5	**5**
5	22X31A7205	5			5			5						5						10	5	**5**
6	22X31A7206	2			4			3			4									10	5	**5**
7	22X31A7207	1			5			5			5									10	5	**5**
8	22X31A7208	5			5			5			5									10	5	**5**
9	22X31A7209	5			5			5			5									9	5	**5**
10	22X31A7210	5			5			5			5									10	5	**5**
11	22X31A7211	5			5			5			4									9	5	**5**
12	22X31A7212	4									5									10	5	**5**
13	22X31A7213	5			5			5			5									9	5	**5**
14	22X31A7214	A			A			A			A			A			A			A	5	**5**
15	22X31A7215	5			5			5			5									10	5	**5**
16	22X31A7216	3			5						2									9	5	**5**
17	22X31A7217	5			5			5			5									10	5	**5**
18	22X31A7218	5			5			5												10	5	**5**
19	22X31A7219	5						5			5						5			10	5	**5**
20	22X31A7220	5			5						5									10	5	**5**
21	22X31A7221	5			4						5						4			9	5	**5**
22	22X31A7222	5						5			5						2			10	5	**5**
23	22X31A7223	5			5			5			5									10	5	**5**
24	22X31A7224	5			5						5									10	5	**5**
25	22X31A7225	5			5			5			5									10	5	**5**
26	22X31A7226	5			5									5			5			10	5	**5**
27	22X31A7227	5			5						5						5			10	5	**5**
28	22X31A7228	5			5			5			5									10	5	**5**
29	22X31A7229	5			1			4			5									10	5	**5**
30	22X31A7230	5			3			1												9	5	**5**
31	22X31A7231				4						4			3			2			10	5	**5**
32	22X31A7232	5			5						5									10	5	**5**
33	22X31A7233	5						5						5			5			10	5	**5**
34	22X31A7234	5			5			5			1									10	5	**5**
35	22X31A7235	5						5			5			5						10	5	**5**
36	22X31A7236	5			5			5			5									10	5	**5**
37	22X31A7237	5			5			5			5									10	5	**5**
38	22X31A7238	5			5						2									9	5	**5**
39	22X31A7239	5			5			5			2									10	5	**5**
40	22X31A7240	A			A			A			A			A			A			A	5	**5**
41	22X31A7241				5			5						5			5			9	5	**5**
42	22X31A7242	5									5			5			5			10	5	**5**
43	22X31A7243	5			5			5			5									10	5	**5**
44	22X31A7244	5						5			5			5						10	5	**5**
45	22X31A7245	5						5			5						5			10	5	**5**
46	22X31A7246	4			3			5			2									9	5	**5**
47	22X31A7247	A			A			A			A			A			A			A	5	**5**
48	22X31A7248	5			5			5									5			10	5	**5**
49	22X31A7249	5			5						5						5			10	5	**5**
50	22X31A7250	5			5			5									5			10	5	**5**
51	22X31A7251				5						5									9	5	**5**
52	22X31A7252	5									5			1			5			9	5	**5**
53	22X31A7253	5						5			5						5			9	5	**5**
54	22X31A7254	5			5			5			5									9	5	**5**
55	22X31A7255	5			5			5			5									10	5	**5**
56	22X31A7256	5									5						2			9	5	**5**
57	22X31A7257	5						5			5						5			10	5	**5**
58	22X31A7258	5						5			5						5			10	5	**5**
59	22X31A7259	5			5						5						5			10	5	**5**
60	22X31A7260	5			5						5						5			10	5	**5**
61	22X31A7261	5			5						5						5			10	5	**5**
62	22X31A7262	5			5						5						4			9	5	**5**
63	22X31A7263	1			3						5									9	5	**5**
64	22X31A7264				2						5									8	5	**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	3.00	0.00	0.00	6.00	3.00	3.00
Number of students performed above the target	54	0	0	46	0	0	38	0	0	47	0	0	9	0	0	20	0	0	61	64	64
Number of students attempted	60	0	0	51	0	0	42	0	0	55	0	0	13	0	0	26	0	0	64	64	64
Percentage of students scored more than target	90%			90%			90%			85%			69%			77%			95%	100%	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 %	90%			90%			90%			85%			69%			77%			95%	100%	100%

CO Attainment based on Exam Questions:

CO - 1																				
CO - 2																				
CO - 3	90%																		95%	100%	100%
CO - 4							90%												95%	100%	100%
CO - 5										90%			90%						95%	100%	100%
CO - 6				90%												90%			95%	100%	100%

CO	**Subj**	obj	aasgn	ppt	Overall	Level
CO-1						
CO-2						
CO-3	90%	95%	100%	100%	96%	3
CO-4	90%	95%	100%	100%	96%	3.00
CO-5	90%	95%	100%	100%	96%	3.00
CO-6	90%	95%	100%	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 : V.SUJATHA | Academic Year: 2022-2023

Branch & Section: AI&DS | Year / Semester: I / II

Course Name: ODE & VC

S.No	Roll Number	Marks Secured	S.No	Roll Number	Marks Secured
1	22X31A7201	42	36	22X31A7236	40
2	22X31A7202	25	37	22X31A7237	46
3	22X31A7203	32	38	22X31A7238	16
4	22X31A7204	34	39	22X31A7239	28
5	22X31A7205	44	40	22X31A7240	
6	22X31A7206	51	41	22X31A7241	22
7	22X31A7207	42	42	22X31A7242	42
8	22X31A7208	41	43	22X31A7243	40
9	22X31A7209	52	44	22X31A7244	33
10	22X31A7210	41	45	22X31A7245	36
11	22X31A7211	43	46	22X31A7246	36
12	22X31A7212	37	47	22X31A7247	14
13	22X31A7213	35	48	22X31A7248	21
14	22X31A7214	31	49	22X31A7249	21
15	22X31A7215	36	50	22X31A7250	21
16	22X31A7216	31	51	22X31A7251	16
17	22X31A7217	27	52	22X31A7252	24
18	22X31A7218	25	53	22X31A7253	22
19	22X31A7219	25	54	22X31A7254	19
20	22X31A7220	31	55	22X31A7255	27
21	22X31A7221	24	56	22X31A7256	22
22	22X31A7222	15	57	22X31A7257	46
23	22X31A7223	22	58	22X31A7258	42
24	22X31A7224	24	59	22X31A7259	42
25	22X31A7225	22	60	22X31A7260	24
26	22X31A7226	21	61	22X31A7261	15
27	22X31A7227	29	62	22X31A7262	22
28	22X31A7228	32	63	22X31A7263	8
29	22X31A7229	31	64	22X31A7264	0
30	22X31A7230	12	65		
31	22X31A7231	22	66		
32	22X31A7232	27	67		
33	22X31A7233	53	68		
34	22X31A7234	30	69		
35	22X31A7235	37	70		
Max Marks		60			

		Attainment Level	% students
Class Average mark	30		
Number of students performed above the target	31	1	40%
Number of successful students	63	2	50%
Percentage of students scored more than target	49%	3	60%
Attainment level	**2**		

SRI INDU INSTITUTE OF ENGINEERING AND TECHNOLOGY

Department of Humanities & Sciences

Course Outcome Attainment

Name of the faculty	V.SUJATHA	Academic Year:	2022-2023
Branch & Section:	AI&DS	Examination:	I 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:	V.SUJATHA	Academic Year:	2022-2023
Branch & Section:	AI&DS	Year:	I
Course Name:	ODE & VC	Semester:	II

CO-PO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
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	**2.50**	**2.67**		**1.00**	**1.00**							**1.50**		

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	**2.50**	**2.67**		**1.00**	**1.00**							**1.50**

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

SRI INDU INSTITUTE OF ENGINEERING AND TECHNOLOGY
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(Approved by AICTE, New Delhi and Affiliated to JNTUH, Hyderabad)
Khalsa Ibrahimpatnam, Sheriguda(V), Ibrahimpatnam(M), Ranga Reddy Dist., Telangana – 501510

ATTENDANCE REGISTER

Link

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