COURSE FILE

ON

MATRICES & CALCULUS

Course Code – MA101BS

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

Prepared by

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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 andpractical skills.
- **IM2:** To Continuous assess of teaching-learning process through institute-industry collaboration.
- **IM3:** To be a center 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 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 associate, 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

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SRI INDU INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. in ELECTRONICS AND COMMUNICATION ENGINEERING
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.	CS102ES	C Programming for Engineers	3	0	0	3
4.	ME102ES	Engineering Workshop	0	1	3	2.5
5.	EN104HS	English for Skill Enhancement	2	0	0	2
6.	EC101ES	Elements of Electronics and Communication Engineering	0	0	2	1
7.	AP105BS	Applied Physics Laboratory	0	0	3	1.5
8.	EN107HS	English Language and Communication Skills Laboratory	0	0	2	1
9.	CS105ES	C Programming for Engineers 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.	CS202ES	Applied Python Programming Laboratory	0	1	2	2
7.	CH206BS	Engineering Chemistry Laboratory	0	0	2	1
8.	EE202ES	Basic Electrical Engineering Laboratory	0	0	2	1
9.	EC202ES	Electronic Devices and Circuits Laboratory	0	0	2	1
		Total	**11**	**3**	**12**	**20**

MATRICES AND CALCULUS
(Course Code: MA101BS)

B.Tech. I Year I Sem.

L	T	P	C
3	1	0	4

Pre-requisites: Mathematical Knowledge at pre-university level

Course Objectives: To learn

- Types of matrices and their properties.
- Concept of a rank of the matrix and applying this concept to know the consistency and solving the system of linear equations.
- Concept of eigenvalues and eigenvectors and to reduce the quadratic form to canonical form.
- Geometrical approach to the mean value theorems and their application to the mathematicalproblems.
- Evaluation of surface areas and volumes of revolutions of curves.
- Evaluation of improper integrals using Beta and Gamma functions.
- Partial differentiation, concept of total derivative.
- Finding maxima and minima of function of two and three variables.
- Evaluation of multiple integrals and their applications.

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

- Write the matrix representation of a set of linear equations and to analyze the solution of thesystem of equations.
- Find the Eigenvalues and Eigen vectors.
- Reduce the quadratic form to canonical form using orthogonal transformations.
- Solve the applications on the mean value theorems.
- Evaluate the improper integrals using Beta and Gamma functions.
- Find the extreme values of functions of two variables with/ without constraints.
- Evaluate the multiple integrals and apply the concept to find areas, volumes.

UNIT - I: Matrices **10 L**

Rank of a matrix by Echelon form and Normal form, Inverse of Non-singular matrices by Gauss-Jordan method, System of linear equations: Solving system of Homogeneous and Non-Homogeneous equations by Gauss elimination method, Gauss Seidel Iteration Method.

UNIT - II: Eigen values and Eigen vectors **10 L**

Linear Transformation and Orthogonal Transformation: Eigenvalues, Eigenvectors and their properties, Diagonalization of a matrix, Cayley-Hamilton Theorem (without proof), finding inverse and power of a matrix by Cayley-Hamilton Theorem, Quadratic forms and Nature of the Quadratic Forms, Reduction of Quadratic form to canonical forms by Orthogonal Transformation.

UNIT - III: Calculus **10 L**

Mean value theorems: Rolle's theorem, Lagrange's Mean value theorem with their Geometrical Interpretation and applications, Cauchy's Mean value Theorem, Taylor's Series.

Applications of definite integrals to evaluate surface areas and volumes of revolutions of curves (Only in Cartesian coordinates), Definition of Improper Integral: Beta and Gamma functions and their applications.

UNIT - IV: Multivariable Calculus (Partial Differentiation and applications) 10 L

Definitions of Limit and continuity.

Partial Differentiation: Euler's Theorem, Total derivative, Jacobian, Functional dependence & independence. Applications: Maxima and minima of functions of two variables and three variables using method of Lagrange multipliers.

UNIT-V: Multivariable Calculus (Integration) 8 L

Evaluation of Double Integrals (Cartesian and polar coordinates), change of order of integration (only Cartesian form), Evaluation of Triple Integrals: Change of variables (Cartesian to polar) for double and (Cartesian to Spherical and Cylindrical polar coordinates) for triple integrals.

Applications: Areas (by double integrals) and volumes (by double integrals and triple integrals).

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, 9^{th} Edition, John Wiley & Sons, 2006.

2. G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, 9^{th} Edition,Pearson, Reprint, 2002.

3. N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications, Reprint, 2008.

4. H. K. Dass and Er. Rajnish Verma, Higher Engineering Mathematics, S Chand and Company Limited, New Delhi.

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

Course : Matrices and Calculus(C111) **Class: I-B.TECH ECE**

Course Outcomes

After completing this course the student will be able to:

C111.1 : Solve the system of Homogeneous and non-Homogeneous equations. (Applying)

C111.2 : Student can judge the nature of the Quadratic form. (Evaluating)

C111.3 : Student can estimate pairwise orthogonality before finding modal matrix. (Creating)

C111.4 : Student can evaluate the surface and volume integrals. (Evaluating)

C111.5 : Student can find the Jacobian of function of two and three variables. (Remembering)

C111.6 : Compare the difference between double integrals and triple integrals in cartesian and polar Coordinates. (Understanding)

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
C111.1	3	2	-	1	1	-	-	-	-	-	-	1
C111.2	3	2	-	1	1	-	-	-	-	-	-	1
C111.3	2	2	-	1	1	-	-	-	-	-	-	1
C111.4	2	3	-	1	1	-	-	-	-	-	-	2
C111.5	3	2	-	1	1	-	-	-	-	-	-	2
C111.6	3	2	-	1	1	-	-	-	-	-	-	2
C111	2.6	2.16	-	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 modelling 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.

C111.1 : Solve the system of Homogeneous and non-Homogeneous equations. (Applying)

	Justification
PO1	Student construct the matrix representation of Homogeneous and non-Homogeneous equations(level 3)
PO2	Student analyze the nature of the Homogeneous and non-Homogeneous equations(level 2)
PO4	Student can use different matrix methods to get solution(level 1)
PO5	Student apply appropriate techniques to solve linear system. (level 1)
PO12	Student can recognize importance of consistent concepts in linear system of equations. (level1)

C111.2 : Student can judge the nature of the Quadratic form. (Evaluating)

	Justification
PO1	Student get the knowledge of diagonalization on finding eigen values and eigen vectors(level 3)
PO2	Student can identify normalization of vectors to get modal matrix in orthogonal transformation(level 2)
PO4	Student can use knowledge of eigen values and eigen vectors in diagonalizing the matrix(level 1)
PO5	Student apply techniques of diagonalization to say nature of quadratic form. (level 1)
PO12	Student can recognize step by step procedure in orthogonal transformation. (level 1)

C111.3 Student can estimate pairwise orthogonality before finding modal matrix. (Creating)

	Justification
PO1	Student get the knowledge of pairwise orthogonal vectors.(level 3)
PO 2	Student can compare the difference between eigenvectors and pairwise orthogonal vectors(level 2)
PO4	Student can use eigenvalues and eigenvectors to find the modal matrix.(level 1)
PO5	Student apply find diagonalized matrix by using modal matrix.(level 1)
PO12	Student can recognize importance of diagonalized matrix for conversion of Quadratic form to Orthogonal transformation(level 1)

C111.4 : Student can evaluate the surface and volume integrals. (Evaluating)

	Justification
PO1	Student get the knowledge of Integration.(level3)
PO2	Student can explain the concept of surface integrals.(level2)
PO4	Student can use techniques of double and triple integrals for finding exact value of integral function.(level 1)
PO5	Student apply formula for finite intervals of volume integration(level 1)
PO12	Student can recognize importance of calculus formulas in surface and volume integrals. (level 1)

C111.5 : Student can find the Jacobian of function of two and three variables. (Remembering)

	Justification
PO1	Student get the knowledge to finding Jacobian of functions(lavel3)
PO2	Student can differentiate the functions of two variables and three variables in finding maxima and minima of functions (lavel2)
PO4	Student can analyze the steps involving in functions of two variables and three variables. (level 1)
PO5	Student can apply partial derivatives for finding Jacobian. (level 1)
PO12	Student can recognize importance of differentiation for finding Jacobian of two and three variables (level 1)

C111.6 : Compare the difference between double integrals and triple integrals in cartesian and polar coordinates(Understanding)

	Justification
PO1	Student get the knowledge to finding double and triple integrals.(level 3)
PO2	Student can differentiate integration in double and triple integrals(level 2)
PO4	Student can analyze the steps involving in cartesian and polar form for multiple integrals(level 1)
PO5	Student apply areas and volume concepts in double and triple integrals(level 1)
PO12	Student can recognize importance of multiple integrals in spherical and polar forms(level 1)

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Lr. No. SIIET/BR22/Academic Calendar/2022/01 Date: 27.10.2022

I B.TECH ACADEMIC CALENDAR FOR THE ACADEMIC YEAR 2022-23

(BR22-REGULATIONS)

Dr. I. Satyanarayana,
Principal,

X3

To,
All the HOD's
Sir,

Sub: SIIET (Autonomous)–Academic & Evaluation–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 and Remidial Mid Test (RMT)	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 and Remidial Mid Test (RMT)	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				

ACE CE PRINCIPAL

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

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Class: ECE Semester: I W.E.F-14-11-2022 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	CPE	ES	M&C	LUNCH	AP	ENG	M&C	LIB
TUE	AP	M&C	ENG		CPE LAB			PPS(T)/AP(T)
WED	EWS/ELCS LAB				M&C	AP	CPE	ENG(T)/M&C(T)
THU	AP LAB				CPE	ENG	ES	AP(T)/CPE(T)
FRI	AP	CPE	ES		EWS/ELCS LAB			M&C(T)/ENG(T)
SAT	ENG	E-ECE LAB			CPE	M&C	AP	E-ECE(T)

Course Code	Course Name	Name of the Faculty	Course Code	Course Name	Name of the Faculty
A101BS	Matrices and Calculus	T.THIRUPATHI REDDY	ME102ES	EWS LAB	M.V.B. KALYAN/B.SRINU NAIK
AP102BS	Applied Physics	B.SANTHI	AP105BS	Applied Physics - Lab	B.SANTHI/M.JANAIAH/ R. YADAGIRI RAO /M.MANISHA
CS102ES	C Programming for Engineers	B.RAJASHWARI	CS105ES	C Programming for Engineers Lab	B.RAJASHWARI/ D.SWAPNA
EN104HS	English for Skill Enhancement	G.VENKAT REDDY	EN107HS	English Language and Communication Skills Lab	G.VENKAT REDDY/E.PRARTHANA
MC101ES	Environmental Sciences	V.MOUNIKA	EC101ES	Elements of Electronics and Communication Engineering	Dr.S.SURESH/Dr.K.SRINIVASA REDDY

B. Santhi
Class In-Charge

Ch. Saritha
Time Table Coordinator

Sri Indu Institute of Engineering & Technology SHERIGUDA 501 510

Head of the Department
Dr. R. YADAGIRI RAO
M.Sc.,B.Ed.,M.Tech(CSE).,Ph.D.
Head of the Department
Department of H&S
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Course Title	**MATRICES AND CALCULUS**
Course Code	**MA101BS**
Programme	**B.Tech**
Year & Semester	**I-year I-semester**
Regulation	**BR22**
Course Faculty	**Mr.T THIRUPATHI REDDY, Assistant Professor , H&S**
sub	**LESSON PLAN**

Matrices and Calculus : Lesson Plan

L/H	Topic	TA/TM	Reference book
1	Unit wise Introduction of Matrices and Calculus Syllabus	Lecture Method	R-1
2	**UNIT –I Matrices** Types of matrices ,examples	Lecture Method	R-1
3	Properties and problems on Symmetric, skew symmetric Matrices	Lecture Method	R-1
4.	Rank of the matrix	Lecture Method	R-1,W1
5.	Rank of the matrix by using Echelon form	Lecture Method	R-1
6	Rank of the matrix by using Normal form	Lecture Method	R-1
7	Problems on Rank of the matrix	Lecture Method	T-1
8	Inverse of the matrix by using Gauss Jordan method	Lecture Method	R-1
9	Problems	Problem solving Method	T-1
10	Concept to know the consistency of Linear system of equations	Lecture Method,Video	R-1
11	Homogeneous system of linear equations and problems	Lecture Method,Video	R-1,T-1
12	Non Homogeneous system of linear equations and problems	Problem solving Method,Video	R-1,T-1
13	Gauss Elimination method and Problems	Lecture Method/ Problem solving Method,Video	T-1,V-4
14	Gauss Seidel Iteration method and Problems	Lecture Method /Problem solving Method,Video	T-1,W2,V-3
15	**UNIT – II** **Eigen values and Eigen Vectors** Introduction of Linear transformation and Orthogonal transformation	Lecture Method,Video	R-1
16	To finding Eigen values and Eigen Vectors of a Matrix	Problem solving Method,Web Presentation,video	T-1,V-1
17	To finding Eigen values and Eigen Vectors of a Matrix	Problem solving Method,Web Presentation,video	T-1
18	Problems	Problem solving Method,Web,Video	T-1,
19	Properties of Eigen values and Eigen vectors	Lecture Method	R-1
20	To find Diagonalization of a Matrix	Lecture Method	T-1
21	Problems on Diagonalization	Problem solving Method	T-1

22	Cayley Hamilton theorem -Problems	Problem solving Method,Video	T-1,V-2
23	Cayley Hamilton theorem -Problems	Problem solving Method,Video	T-1
24	Finding Inverse and powers of a Matrix by using Cayley Hamilton theorem	Lecture Method,Video	R-1
25	Finding Inverse and powers of a Matrix by using Cayley Hamilton theorem	Lecture Method,Video	R-1,V-2
26	Quadratic form - Introduction	Lecture Method	T-1
27	Nature and Signature of Quadratic form	Lecture Method	R-1
28	Reduction of Quadratic form to Canonical form by using Orthogonal transformation	Lecture Method	R-1
29	**UNIT - III Calculus** Introduction of Mean value theorems	Lecture Method	R-1
30	Rolle's Mean value theorem - Problems	Problem solving Method,web presentation	R-1
31	Lagrange's Mean value theorem-Problems	Problem solving Method ,web presentation	R-1,w4
32	Applications	Lecture Method	R-1
33	Cauchy's mean value theorem –Problems	Problem solving Method, web presentation	R-1,T-1
34	Taylor's Series - Problems	Problem solving Method	R-1,T-1
35	Applications of definite integrals to evaluate surface areas and volumes of revolutions of curves	Lecture Method	R-1
36	Introduction of Improper Integrals Applications of definite integrals to evaluate surface areas and volumes of revolutions of curves	Lecture Method	R-1
37	Introduction of Improper Integrals	Lecture Method	R-1
38	Beta and Gamma functions and their properties - problems	Problem solving Method	R-1,T-1
39	**UNIT - IV** **Multi variable Calculus (Partial differentiation and applications)** Introduction of Limit and Continuity	Lecture Method	R-1
40	Euler's theorem - Problems	Problem solving Method	R-1,T-1
41	Total derivative - Problems	Problem solving Method	R-1,T-1
42	Jacobian - Problems	Problem solving Method	R-1,T-1
43	Functional dependence & independence - Problems	Problem solving Method	T-1
44	Functional dependence &independence Problems	Problem solving Method	T-1
45	Maxima and Minima of functions of two variables - Problems	Problem solving Method,Video	T-1,V-5,W3
46	Maxima and Minima of functions of two variables - Problems	Problem solving Method,Video	T-1,V-5
47	Maxima and Minima of functions of three variables - Problems	Problem solving Method,Video	T-1,V-5
48	Maxima and Minima of functions of three variables - Problems	Problem solving Method,Video	T-1,V-5
49	**UNIT-V** **Multi variable calculus (Integration)** Introduction to multiple integration	Lecture Method	R-1
50	Evaluation of double integrals in Cartesian and polar coordinates	Lecture Method	R-1
51	Change of order of integration in Cartesian form	Lecture Method	R-1
52	Evaluation of triple integrals	Problem solving Method,Video	T-1
53	Change of variables Cartesian to polar in double integrals	Problem solving Method,Video	T-1
54	Change of variables Cartesian to spherical in triple integrals	Problem solving Method,Video	T-1
55	Change of variables Cartesian to Cylindrical in triple	Lecture	R-1

	integrals	Method	
56	Areas by double integrals	Lecture Method	R-1
57	Volumes by double and triple integrals	Lecture Method	R-1,w5

REFERENCES :

R-1 .Ramana B.V.,Higher Engineering Mathematics, Tata McGRAW Hill,New

DelhiR-2 .N.P. Bali and Manish Goyal,A text book of Engineering Mathematics

TEXTBOOKS :

T-1 B.S.Grewal,Higher Engineering Mathematics,Khanna

PublishersT-2 Erwin Kreyszig,Advanced Engineering

Mathematics

GAP WITHIN THE SYLLABUS – MAPPING TO CO, PO

Cramer's rule,Matrix inversion method, Importance of sequence ,Continuity and differentiability of a function with examples, Integration and differentiation methods

Course Outcomes

After completing this topic the student will be able to:

1. student can compare methods in solving linear system of equations.(Analysis)
2. After knowing calculus concepts student can easily solve partial differential equations methods andproblems(Application)
3. After knowing calculus methods student can easily define beta gamma derivations (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	2	3	–	–	–	–	–	–	–	–	–	–
2	3	2	–	–	–	–	–	–	–	–	–	–
3	2	2	–	–	–	–	–	–	–	–	–	–

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 ensuretheir 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 :

W-1 https://en.wikipedia.org/wiki/Rank_(linear_algebra) (For UNIT-I,UNIT-II)

W-2 http://mathforcollege.com/ma/book2021/gauss-seidel-method.html (For UNIT- I)

W-3 https://tutorial.math.lamar.edu/Classes/CalcIII/RelativeExtrema.aspx (For UNIT-III)

W-4 https://courses.lumenlearning.com/calculus1/chapter/the-mean-value-theorem-for-integrals (For UNIT-IV)

W-5 https://math.stackexchange.com/questions/1903927/volume-of-solid-rotated-about-y-axis(For UNIT-V)

VIDEO REFERENCES :

V-1 https://www.youtube.com/watch?v=h5urBuE4Xhg(Video for Eigen values and eigen vectors)

V-2 https://www.youtube.com/watch?v=8D3WViAyJvc (Cayley-Hamilton Theorem)

V-3 https://www.youtube.com/watch?v=ajJD0Df5CsY (For Gauss seidal iteration method)

V-4 **https://www.youtube.com/watch?v=2j5Ic2V7wq4 (For Gauss Elimination method)**

V-5 https://www.youtube.com/watch?v=gLWUrF_cOwQ (For Maxima and Minima)

V-6 https://www.youtube.com/watch?v=ry9cgNx1QV8 (For Maxima and Minima)

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

M&C LECTURE NOTES

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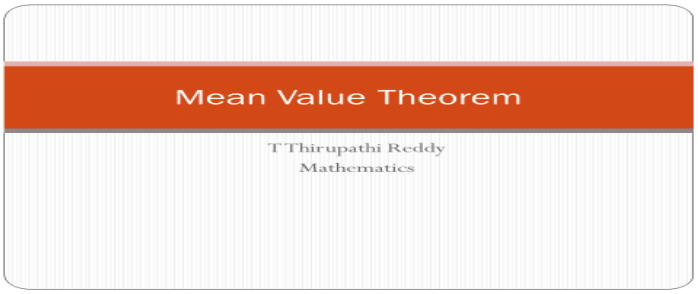
POWERPOINT PRESENTATION



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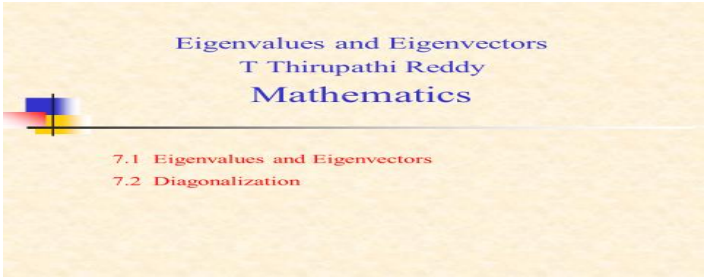

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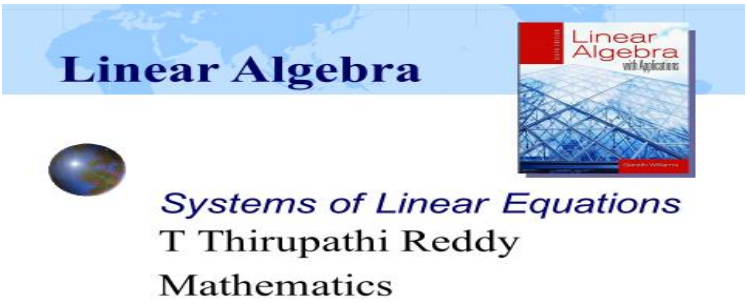

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PREVIOUS QUESTION PAPERS

https://drive.google.com/file/d/1dIABobEjhLe0bpp0c--M1mkvHlpwhzzr/view?usp=sharing

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Set-I

I B.TECH SEM-I MID-I EXAMINATION Dec-2022/Jan-2023

Year & Branch: Common to All — Date & Session : 29-12-2022 &FN

Subject : MATRICES & CALCULUS — Marks: 20 — Time : 2 Hours

Part-B

Answer any **FOUR** Questions. All Question Carry Equal Marks.

1. Define the Rank of the Matrix and find the rank of the following matrix using Echelon form

$$\begin{bmatrix} 1 & 2 & 3 & 4 \\ -2 & -3 & 1 & 2 \\ -3 & -4 & 5 & 8 \\ 1 & 3 & 10 & 14 \end{bmatrix}$$ **(Remembering(L1))**

2. Show that the equations x -4y +7z =14,3x + 8y -2z = 13, 7x – 8y +26z = 5 are inconsistent **(Evaluating(L5))**

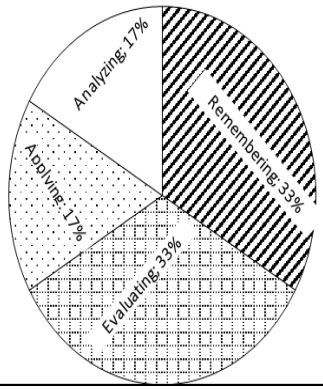
3. . Solve the system of equations 10x + y + z =12, 2x + 10y + z =13,2x + 2y + 10z =14 by using Gauss seidel iteration method **(Applying(L3))**

4. If $A = \begin{bmatrix} 2 & 1 & 1 \\ 0 & 1 & 0 \\ 1 & 1 & 2 \end{bmatrix}$ find the value of the matrix $A^8 - 5A^7 + 7A^6 - 3A^5 + A^4 - 5A^3 + 8A^2 - 2A + I$ using Cayley Hamilton theorem **(Remembering(L1))**

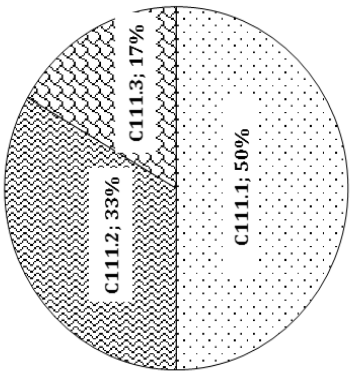
5 .Reduce the given Quadratic form to canonical form 2xy+2yz+2zx by orthogonal reduction and find the Nature, Index and Signature of Quadratic form. **(Analyzing(L4))**

6. Verify Rolle's theorem for $f(x) = e^x(\sin x - \cos x)$ in $[\frac{\pi}{4}, \frac{5\pi}{4}]$ **(Evaluating(L5))**

QUESTION PAPER MAPPING WITH BT



QUESTION PAPER MAPPING WITH CO'S



Mid-1 answer script: https://drive.google.com/file/d/1gunCXPVVLaJZ5s5Td7oLFTIUNgzDCUnx/view?usp=sharing

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Set-II

I B.TECH SEM-I MID-II EXAMINATION March-2023

Year & Branch: Common to All — Date & Session : 03-03-2023 &FN

Subject : MATRICES & CALCULUS — Marks: 20 — Time : 2 Hours

Part-B

Answer any **FOUR** Questions. All Question Carry Equal Marks.

1. a) Express f(x) = logcosx as Taylor's series about x = π/3 **Understanding(L2)**

   b) Obtain the Maclaurin's series expansion of f(x) = cosx **Understanding(L2)**

2. If x+y+z =u , y+z =uv, z = uvw then evaluate i) $\frac{\partial(x,y,z)}{\partial(u,v,w)}$ ii) $\frac{\partial(u,v,w)}{\partial(x,y,z)}$

   Evaluating(L5)

3. Find the maximum and minimum distances of the point of $u = x^2y^3z^4$ if $2x+3y+4z = a$ **Remembering(L1)**

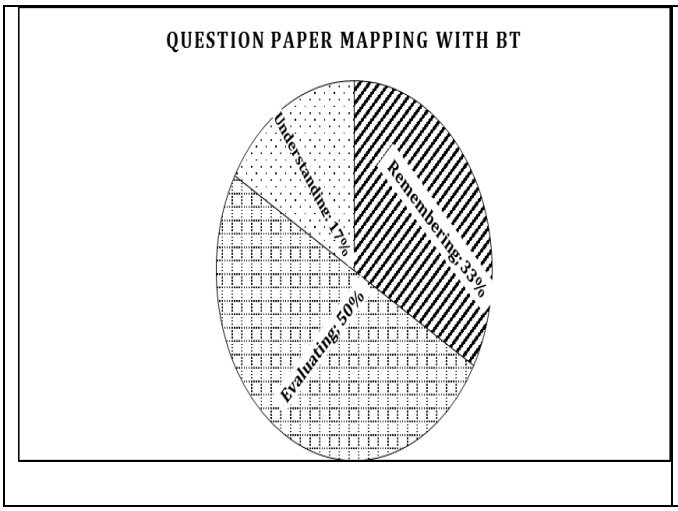
4. Evaluate i) $\int_0^5 \int_0^{x^2} x(x^2+y^2)\,dxdy$ **Evaluating(L5)**

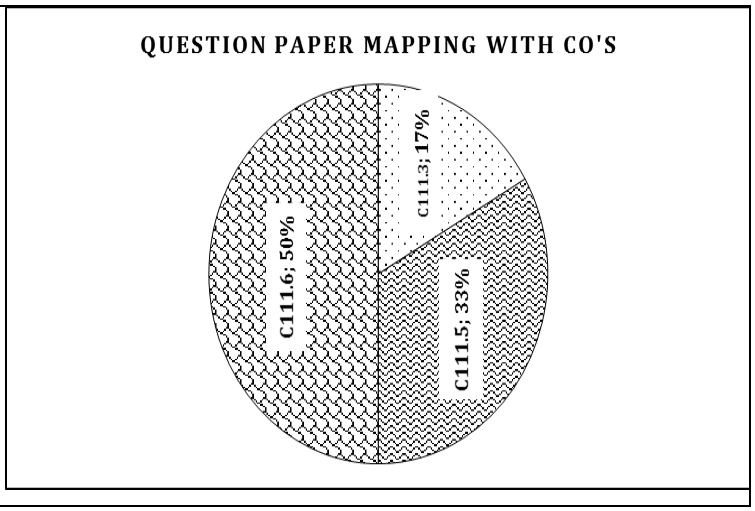
   ii) $\int_0^4 \int_0^{x^2} e^{\frac{y}{x}}\,dxdy$ **Evaluating(L5)**

5. $Evaluate \int_0^{\pi} \int_0^{a(1+cos\theta)} r^2 cos\theta\, dr d\theta$ **Evaluating(L5)**

6. Find the area of the region bounded by the parabolas $y^2=4ax$ and $x^2 = 4ay$

   Remembering(L1)





Mid-2 answer script: https://drive.google.com/file/d/1snjUryv-KaMn3CJb6gDF7mTP3IrSlNkn/view?usp=sharing

MID I & MID-II KEY link

https://drive.google.com/file/d/1r_tqhyATwxUgbvZDkhQ_c1jCjVvOl78k/view?usp=sharing

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I-MID M&C ASSIGNMENT

1. Define the Rank of the Matrix and find the rank of the following matrix using Echelon form

$$\begin{bmatrix} 1 & 2 & 3 & 4 \\ -2 & -3 & 1 & 2 \\ -3 & -4 & 5 & 8 \\ 1 & 3 & 10 & 14 \end{bmatrix}$$

2. Define the Rank of the Matrix and find the rank of the following matrix using Normal form

$$\begin{bmatrix} 2 & 1 & 3 & 4 \\ 0 & 3 & 4 & 1 \\ 2 & 3 & 7 & 5 \\ 2 & 5 & 11 & 6 \end{bmatrix}$$ (Remembering(L1))

3. Find the value of k if the rank of the matrix A is 2 where $A = \begin{bmatrix} 0 & 1 & -3 & -1 \\ 1 & 0 & 1 & 1 \\ 3 & 1 & 0 & 2 \\ 1 & 1 & k & 0 \end{bmatrix}$ (Remembering(L1))

4. Find the inverse of the matrix A using Gauss Jordan Method (Elementary row operations)

$$\begin{bmatrix} 1 & 1 & 3 \\ 1 & 3 & -3 \\ -2 & -4 & -4 \end{bmatrix}$$ (Remembering(L1))

5. Discuss for what values of a , b the simultaneous equations x+y+z = 6, x+2y+3z = 10,x+2y+az=b have i) no solution ii) a unique solution iii)an infinite number of solutions (Creating(L6))

6. Show that the system of equations x+2y+z = 3, 2x + 3y +2z = 5,3x-5y+5z = 2, 3x+9y-z = 4 are Consistent and solve them. (Evaluating(L5))

7. Solve the system of equations 10x + y + z =12, 2x + 10y + z =13,2x + 2y + 10z =14 by using Gauss Seidel Iteration Method (Applying(L3))

8. Verify Cayley Hamilton theorem and find A^{-1} and A^4 for the matrix $A = \begin{bmatrix} 7 & 2 & -2 \\ -6 & -1 & 2 \\ 6 & 2 & -1 \end{bmatrix}$ (Evaluating(L5))

9. If $A = \begin{bmatrix} 2 & 1 & 1 \\ 0 & 1 & 0 \\ 1 & 1 & 2 \end{bmatrix}$ find the value of the matrix $A^8 - 5A^7 + 7A^6 - 3A^5 + A^4 - 5A^3 + 8A^2 - 2A + I$ using Cayley Hamilton theorem (Remembering(L1))

10. Prove that the sum of Eigen values of the matrix A is equal to its trace of A and product of Eigen values to its determinant. (Evaluating(L5))

11. Diagonalize the matrix $A = \begin{bmatrix} 8 & -8 & -2 \\ 4 & -3 & -2 \\ 3 & -4 & 1 \end{bmatrix}$ (Analyzing(L4))

12. Reduce the Quadratic form $3x^2 + 5y^2 + 3z^2 - 2yz + 2zx - 2xy$ to the canonical form by orthogonal Reduction and find the Nature, rank, index and signature of the Quadratic form (Analyzing(L4))

13. Reduce the given Quadratic form to canonical form 2xy+2yz+2zx by orthogonal reduction and find the Nature, Index and Signature of Quadratic form. (Analyzing(L4))

14. Verify Rolle's theorem for $f(x) = e^x(\sin x - \cos x)$ in $[\frac{\pi}{4}, \frac{5\pi}{4}]$ (Evaluating(L5))

15. State Rolle's theorem and verify for $f(x) = x^3 - 6x^2 + 11x - 6$ in [1,3] (Understanding(L2)

Mid1 Assignment **https://drive.google.com/file/d/1r8WZaHDmf0ftXWC8GvIC7iJkdok_GC_t/view?usp=sharing**

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II-MID M&C ASSIGNMENT

1. a) Express f(x) = logcosx as Taylor's series about x = π/3 **Understanding(L2)**

   b) Obtain the Maclaurin's series expansion of f(x) = cosx **Understanding(L2)**

2. Find the volume of the solid generated by revolving the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ (o<b<a) rotates about major axis **Remembering(L1)**

3. Show that the area of the surface generated by the revolution about the x-axis of the loop of the curve $3ay^2 = x(x-a)^2$ is $\frac{\pi a^2}{3}$ **Evaluating(L5)**

4. If $z = \log(e^x + e^y)$ show that $rt-s^2 = 0$ **Evaluating(L5)**

5. Using Euler's theorem , prove that $x\frac{\partial u}{\partial x} + y\frac{\partial u}{\partial y} = \sin 2u$ if $u = \tan^{-1}\left(\frac{x^3+y^3}{x+y}\right)$ **Applying(L3)**

6. If u = f(r) and x= rcosθ, y = rsinθ then prove that $\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} + \frac{\partial^2 u}{\partial z^2} = f^{II}(r) + \frac{1}{r} f^{I}(r)$ **Evaluating(L5)**

7. Find $\frac{du}{dx}$ if $u = \sin(x^2 + y^2)$ where $a^2x^2 + b^2y^2 = c^2$ **Remembering(L1)**

8. If x+y+z =u , y+z =uv, z = uvw then evaluate i) $\frac{\partial(x,y,z)}{\partial(u,v,w)}$ ii) $\frac{\partial(u,v,w)}{\partial(x,y,z)}$ **Evaluating(L5)**

9. Showthat the functions u=x+y+z, v=xy+yz+zx and $w=x^2 + y^2 + z^2$ are functionally dependent and find the relation between them **Evaluating(L5)**

10. Find the maximum and minimum distances of the point of $u = x^2y^3z^4$ if 2x+3y+4z =a **Remembering(L1)**

11. Find the maxima and minima of the function $f(x,y) = x^3 + 3xy^2 - 15x^2 - 15y^2 + 72x$ **Remembering(L1)**

12. Evaluate i) $\int_0^5 \int_0^{x^2} x(x^2 + y^2)\,dxdy$ **Evaluating(L5)**

    ii) $\int_0^4 \int_0^{x^2} e^{\frac{y}{x}}\,dxdy$ **Evaluating(L5)**

13. Solve $\int_0^{\log 2} \int_0^{x} \int_0^{x+\log y} e^{x+y+z}\,dxdydz$ **Evaluating(L5)**

14. Find the area of the region bounded by the parabolas $y^2=4ax$ and $x^2 = 4ay$ **Remembering(L1)**

15. Evaluate the double integral $\int_0^{4a} \int_{\frac{y^2}{4a}}^{y} \left(\frac{x^2-y^2}{x^2+y^2}\right) dxdy$ by changing into polar coordinates **Evaluating(L5)** 16.Change the order of integration in $\int_0^1 \int_{x^2}^{2-x} xydxdy$ and hence evaluate the double integral **Creating(L6)**

Mid2 Assignment https://drive.google.com/file/d/1wGZY_poYzxHtNUTxKir-RRwWoBwAdoLT/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.	Using row1 and column1 operations (C111.1) (Analyzing)	1
	Using row2 and column2 operations (C111.1) (Analyzing)	1
	Using row3 and column3 operations & get rank (C111.1) (Analyzing)	3
2.	To write matrix form (C111.1) (Analyzing)	1
	To write augmented form and getting rank using echelon form anf rank of A not equal to rank of [A;B](C111.1) (Analyzing)	2
	To compare consistency and to get solution(C111.1) (Analyzing)	2
3.	To check diagonal dominant (C111.1) (Analyzing)	1
	To find iterations until get solution (C111.1) (Analyzing)	4
4.	To find characteristic equation of A (C111.2) (Applying)	2
	Using Cayley Hamilton theorem and Calculations(C111.2) (Applying)	3
5.	To form matrix for the given quadratic form(C111.2) (Applying)	1
	To find Eigen values and Eigen vectors (C111.2) (Applying)	2
	To get $P^TAP = D$ and writing canonical form, rank, index and signature(C111.2) (Applying)	2
6.	To check continuous and derivable and f(a)=f(b) of f(x) (C111.3) (Creating)	3
	To apply Rolle's theorem and get value of c (C111.3) (Creating)	2
	TOTAL	**20**

SCHEME OF EVALUATION-MATRICES & CALCULUS(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 a)	To write Taylor's series expansion (C111.3) (Creating)	1
	To calculate value of f(x) = logcosx at x = $\pi/3$(C111.3) (Creating)	1
b)	To write Maclaurin's series expansion(C111.3) (Creating)	1
	To calculate value of f(x) = cosx at x = 0(C111.3) (Creating)	2
2.	To find Jacobian of x,y,z with respect to u,v,w (C111.5) .(Remembering)	3
	To find Jacobian of u,v,w with respect to x,y,z .(C111.5)(Remembering)	2
3.	Using Lagrange's method of multipliers formula .(C111.5)(Remembering)	1
	To calculate maximum and minimum values .(C111.5)(Remembering)	4
4.	To evaluate $\int_0^5 \int_0^{x^2} x(x^2+y^2)$dxdy (C111.6) (Understanding)	2
	To evaluate $\int_0^4 \int_0^{x^2} e^{\frac{y}{x}}$ dxdy (C111.6) (Understanding)	3
5.	To $Evaluate \int_0^{\pi} \int_0^{a(1+cos\theta)} r^2 cos\theta dr d\theta$ (C111.6) (Understanding)	5
6.	To take limits of x and y (C111.6) (Understanding)	2
	To find area of the region bounded by the parabolas (C111.6) (Understanding)	3
	TOTAL	**20**

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TUTORIAL TOPICS

S. No	Topic	Teaching Method/Teaching Aid	No.of Sessions Planned	Reference book
1	Rank of the matrix by using Echelon form	Lecture Method	1	R-1
2	Rank of the matrix by using Normal form	Lecture Method	1	R-1
3	Inverse of the matrix by using Gauss Jordan method	Lecture Method	1	R-1
4	Homogeneous system of linear equations and problems	Lecture Method,Video	1	R-1,T-1,V-1
5	Non Homogeneous system of linear equations and problems	Problem solving Method,Video	1	R-1,T-1,V-1
6	Gauss Elimination method and Problems	Lecture Method/ Problem solving Method,Video	1	T-1,V-5
7	Gauss seidel Iteration method and Problems	Lecture Method /Problem solving Method,Video	1	T-1,V-4
8	To finding Eigen values and Eigen Vectors of a Matrix	Problem solving Method,Web Presentation,video	1	T-1,W-2,V-1
9	To find Diagonalization of a Matrix	Lecture Method	1	T-1
10	Cayley Hamilton theorem -Problems	Problem solving Method,Video	1	T-1,V-2
11	Reduction of Quadratic form to Canonical form by using Orthogonal transformation	Lecture Method	1	R-1
12	Rolle's Mean value theorem - Problems	Problem solving Method,web presentation	1	R-1,W-5
13	Lagrange's Mean value theorem-Problems	Problem solving Method ,web presentation	1	R-1,W-5
14	Cauchy's mean value theorem –Problems	Problem solving Method, web presentation	1	R-1,T-1,W-5
15	Taylor's Series - Problems	Problem solving Method	1	R-1,T-1
16	Applications of definite integrals to evaluate surface areas and volumes of revolutions of curves	Lecture Method	1	R-1
17	Euler's theorem - Problems	Problem solving Method	1	R-1,T-1
18	Total derivative - Problems	Problem solving Method	1	R-1,T-1
19	Jacobian - Problems	Problem solving Method	1	R-1,T-1
20	Functional dependence & independence - Problems	Problem solving Method	1	T-1
21	Maxima and Minima of functions of two variables - Problems	Problem solving Method,Video	1	T-1,V-8
22	Evaluation of double integrals in Cartesian and polar coordinates	Lecture Method	1	R-1
23	Change of order of integration in Cartesian form	Lecture Method	1	R-1
24	Evaluation of triple integrals	Problem solving Method,Video	1	T-1,V-9

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Result Analysis: ECE

Course Title	MATRICES & CALCULUS
Course Code	**MA101BS**
Programme	B.Tech
Year & Semester	I year I- semester
Regulation	BR22
Course Faculty	T Thirupathi Reddy, Assistant Professor , H&S

Weak Students:

S No	Roll no	Intermediate Marks	Internal-I Status (35)	Internal-II Status (40)
1	22X31A0401	58%	25	36
2	22X31A0403	69%	28	38
3	22X31A0413	68.5%	24	39
4	22X31A0428	59.4%	20	36
5	22X31A0429	55.9%	20	26
6	22X31A0430	41.2%	18	30
7	22X31A0431	69.6%	20	22
8	22X31A0432	59.7%	20	27
9	22X31A0435	58.5%	22	23
10	22X31A0440	50.2%	23	25
11	22X31A0443	63.6%	24	28
12	22X31A0448	55%	18	33
13	22X31A0454	55.3%	23	32

Advanced learners:

S No	Roll No	Intermediate Marks	Gate Material
1	22X31A0402	95.9%	Probability,Discrete Mathematics,Graph theory,Differential Equations
2	22X31A0434	90.9%	
3	22X31A0442	93.8%	
4	22X31A0449	91.4%	
5	22X31A0455	91%	
6	22X31A0458	95.6%	
7	22X31A0459	93%	

SRI INDU INSTITUTE OF ENGINEERING AND TECHNOLOGY

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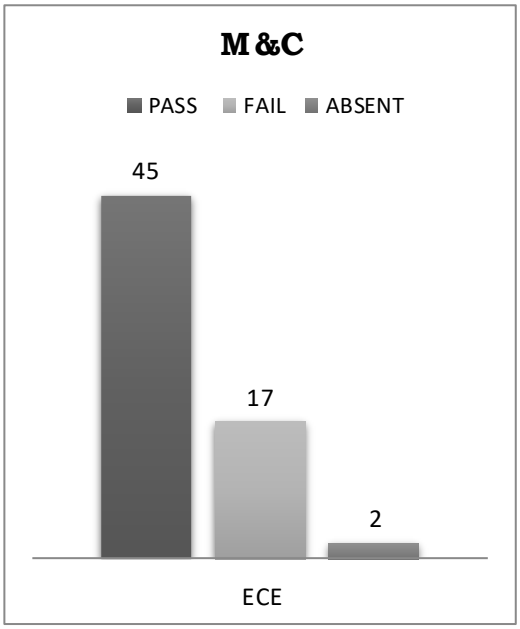
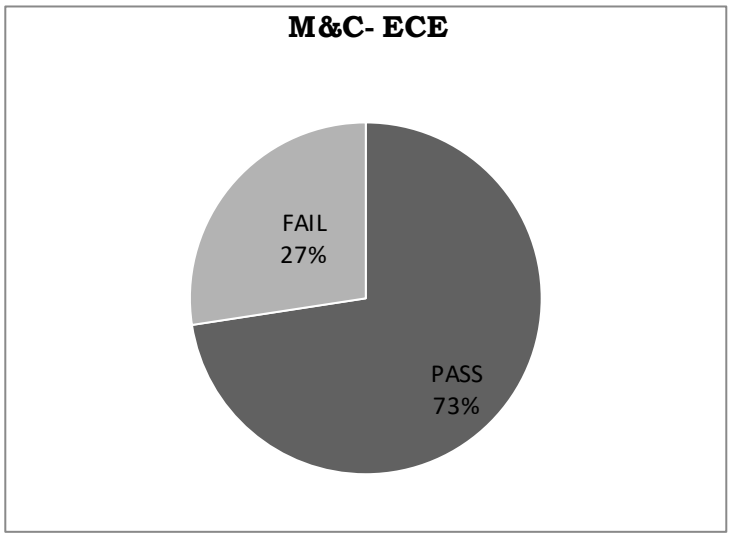
(Approved by AICTE, New Delhi and Affiliated to JNTUH, Hyderabad)

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

RESULT ANALYSIS AT THE END OF SEMESTER

Branch : ECE **Subject: MATRICES & CALCULUS**





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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	M&C	PPS	BEE	EG	EC	M&C
CSE-B	BEE	M&C	EG	PPS	EC	BEE
CSE-C	EC	EG	BEE	M&C	PPS	EC

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	M&C	EC	BEE	PPS	EG	EC
CYBER	PPS	M&C	EC	EG	BEE	M&C

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	AP	PPS	M&C	ENG	AP	M&C
AIML-B	M&C	EG	PPS	AP	M&C	EG

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	M&C	ENG	AP	PPS	AP	PPS
IOT	PPS	AP	M&C	EG	M&C	EG

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	AP	ENG	M&C	PPS	AP	PPS
CIVIL	EG	AP	M&C	PPS	M&C	EG

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:	M&C	Year: I	Semester: I

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	5						2			5						2			6	**5**
2	22X31A0402	5			5			5									5			7	**5**
3	22X31A0403	5			5			5									4			4	**5**
4	22X31A0404	5			4			5			4									7	**5**
5	22X31A0405	5			5			5			5									6	**5**
6	22X31A0406	5			5			5									4			6	**5**
7	22X31A0407	3			4						4									5	**5**
8	22X31A0408	4						5			5			4						6	**5**
9	22X31A0409				5			5			5						5			8	**5**
10	22X31A0410	5			5			5			4									8	**5**
11	22X31A0411	4			5			5			5									7	**5**
12	22X31A0412	4			5			5			5									7	**5**
13	22X31A0413	5			5												5			4	**5**
14	22X31A0414				5			5			5						5			9	**5**
15	22X31A0415	5			5			5			5									9	**5**
16	22X31A0416	4			5						5						4			7	**5**
17	22X31A0417				5			5			1						5			8	**5**
18	22X31A0418	5						5						2			5			5	**5**
19	22X31A0419	5			5			5									4			7	**5**
20	22X31A0420	4			5			5			5									7	**5**
21	22X31A0421	4			2												3			4	**5**
22	22X31A0422	4															4			4	**5**
23	22X31A0423	3			2			5									5			5	**5**
24	22X31A0424	A			A			A			A						A			A	**A**
25	22X31A0425	4			4			5									4			6	**5**
26	22X31A0426	3						4			4						5			6	**5**
27	22X31A0427	4						5			5						5			5	**5**
28	22X31A0428	3						1			1						4			6	**5**
29	22X31A0429	4			3												1			7	**5**
30	22X31A0430	4									0						5			4	**5**
31	22X31A0431	4			5												1			5	**5**
32	22X31A0432	3			1			3			3									5	**5**
33	22X31A0433				5			5			5						4			8	**5**
34	22X31A0434	5			5			5			5									5	**5**
35	22X31A0435	3			5						1						2			6	**5**
36	22X31A0436	4			5			2			5									4	**5**
37	22X31A0437	4															5			6	**5**
38	22X31A0438	2																		8	**5**
39	22X31A0439	5			3			5									3			3	**5**
40	22X31A0440	5			5												5			3	**5**
41	22X31A0441	5			5						5						5			6	**5**
42	22X31A0442	5						5			5						5			6	**5**
43	22X31A0443	4			5			5			3									2	**5**
44	22X31A0444	4			5			4												4	**5**
45	22X31A0445	4						5			5						5			6	**5**
46	22X31A0446	5			5						3						4			6	**5**
47	22X31A0447	5			3						2						5			9	**5**
48	22X31A0448	3			2			1									2			5	**5**
49	22X31A0449				5			5			5						5			6	**5**
50	22X31A0450	4			4			5			5									4	**5**
51	22X31A0451	4			4						3						5			4	**5**
52	22X31A0452	4						3			5						4			4	**5**
53	22X31A0453	A			A			A			A						A			A	**A**
54	22X31A0454	4			2						2						4			6	**5**
55	22X31A0455	5						5			5						5			6	**5**
56	22X31A0456	5									4									5	**5**
57	22X31A0457	4						5									4			4	**5**
58	22X31A0458	5						5			5						4			7	**5**
59	22X31A0459	4						4			2						4			5	**5**
60	22X31A0460	4			2			5			2									6	**5**
61	22X31A0461	5			2						5						4			6	**5**
62	22X31A0462	4						5			5						5			4	**5**
63	22X31A0463	5									5			2			5			5	**5**
64	22X31A0464	4			2			1			1									7	**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
Number of students performed above	56	0	0	34	0	0	37	0	0	34	0	0	1	0	0	38	0	0	36	62
Number of students attempted	59	0	0	44	0	0	44	0	0	45	0	0	3	0	0	45	0	0	64	64
Percentage of students scored more than target	95%			77%			84%			76%			33%			84%			56%	97%

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 %	95%			77%			84%			76%			33%			84%			56%	97%

CO Attainment based on Exam Questions:

CO - 1	95%			77%														56%	97%
CO - 2							84%			84%						84%		56%	97%
CO - 3													84%					56%	97%
CO - 4																			
CO - 5																			
CO - 6																			

CO	**Subj**	obj		Asgn	Overall	Level
CO-1	86%	67%		97%	83%	3.00
CO-2	84%	77%		97%	86%	3.00
CO-3	84%	70%		97%	84%	3.00
CO-4						
CO-5						
CO-6						
Attainment (Internal 1 Examinatio						**3.00**

ttainment Lev	
1	40%
2	50%
3	60%

SRI INDU INSTITUTE OF ENGINEERING AND TECHNOLOGY

Department of Humanities & Sciences

Course Outcome Attainment (Internal Examination-2)

Name of the facu	T THIRUPATHI REDDY	Academic Year:	2022-2023
Branch & Sectio	ECE	Examination:	II Internal
Course Name:	M&C	Year: I	Semester: I

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 ==>		3	2		5			5			3	2		5			5			10	5	5
1	22X31A0401	1	2		5						3	2					4			9	5	5
2	22X31A0402				5			5			2	2					4			9	5	5
3	22X31A0403	3	2					4			3	2					4			10	5	5
4	22X31A0404	3	1		4			5									4			8	5	5
5	22X31A0405	3	2		5			5			3	2								10	5	5
6	22X31A0406	A	A		A			A			A	A		A			A			A	5	5
7	22X31A0407	3	2		5			5									5			10	5	5
8	22X31A0408	3	2		5			5			3	2								9	5	5
9	22X31A0409	3	2		5			5			3	2								9	5	5
10	22X31A0410	2	2		5			5									5			9	5	5
11	22X31A0411	3	2		5			5									5			8	5	5
12	22X31A0412				4			5			3	2					5			9	5	5
13	22X31A0413	3	2		5			5									4			10	5	5
14	22X31A0414	3	2		5			5									5			10	5	5
15	22X31A0415	3	2		5			5			3	2								8	5	5
16	22X31A0416	3	2		4			5									5			9	5	5
17	22X31A0417	3	1		5						3	0					5			7	5	5
18	22X31A0418	3	2		4			5									1			7	5	5
19	22X31A0419	2	2		5			5			3	2								7	5	5
20	22X31A0420	3	2		5						2	0					5			8	5	5
21	22X31A0421	3	2		5			5									5			8	5	5
22	22X31A0422																				A	5
23	22X31A0423	1	0		2			1			1	0								9	A	5
24	22X31A0424	3	1		2			4			3	1								9	5	5
25	22X31A0425	1	1		5						1	0								6	5	5
26	22X31A0426	3	2		5			3			3	2								8	5	5
27	22X31A0427	3	2		5			5			3	2								7	5	5
28	22X31A0428	3	2		5			5			3	1								7	5	5
29	22X31A0429	2	1		5						2						2			9	A	5
30	22X31A0430	2	1		3						3	2		2						7	5	5
31	22X31A0431	1															3			8	5	5
32	22X31A0432	3			2						1	0						3		8	5	5
33	22X31A0433	3	2		5			5			3	2								8	5	5
34	22X31A0434	3	2		5			5			3	2								9	5	5
35	22X31A0435	2			3															8	5	5
36	22X31A0436	3	2		5			5			3	2								8	A	5
37	22X31A0437	A	A		A			A			A	A		A			A	A	A	A	A	5
38	22X31A0438	2	0		2															8	5	5
39	22X31A0439	3	2		5			0			2	0								8	5	5
40	22X31A0440	1	2		2			1			2	0								7	5	5
41	22X31A0441	3	2		5			5									5			8	5	5
42	22X31A0442	3	2		5			5			3	0								7	5	5
43	22X31A0443	3	2		5			2												6	5	5
44	22X31A0444	1	1		1			4												6	5	5
45	22X31A0445				4			5			3	2					5			6	5	5
46	22X31A0446	3	0		2			2			3	0								5	5	5
47	22X31A0447	3	2		4									1			5			9	5	5
48	22X31A0448				2			5			3	2					4			7	5	5
49	22X31A0449	3	2		5			5			3	2								6	5	5
50	22X31A0450	3	2		2			3			3	2								8	5	5
51	22X31A0451				4			0			3	0					4			6	5	5
52	22X31A0452	3	1		3			3									5			7	5	5
53	22X31A0453	3	1					5			3	2								7	5	5
54	22X31A0454	2	1		5			3			3	2								6	5	5
55	22X31A0455	3	2		5			5			3	2								7	5	5
56	22X31A0456	2	2		4															7	5	5
57	22X31A0457				5			5			3	2					5			9	5	5
58	22X31A0458	3	2		5			5			3	2								6	5	5
59	22X31A0459	3	1		5			5			2	2								8	5	5
60	22X31A0460	3	1		5						3	2					5			8	5	5
61	22X31A0461	3	2		4			5			3	2								6	5	5
62	22X31A0462	3	2		5			5						2						8	5	5
63	22X31A0463	3	2		5			5			3	2								8	5	5
64	22X31A0464	3	1		1			5			3	2								7	5	5

Target set by the faculty / HoD	1.80	1.20	0.00	3.00	0.00	0.00	3.00	0.00	0.00	1.80	1.20	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	49	36	0	48	0	0	42	0	0	39	29	0	0	0	0	23	1	0	60	59	64
Number of students attempted	57	54	0	60	0	0	50	0	0	44	43	0	5	0	0	27	2	1	63	64	64
Percentage of students scored more than target	86%	67%		80%			84%			89%	67%		0%			85%	50%	0%	95%	92%	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 %	86%	67%		80%			84%			89%	67%		0%			85%	50%	0%	95%	92%	100%

CO Attainment based on Exam Questions:

CO - 1																				
CO - 2																				
CO - 3	86%																	95%	92%	92%
CO - 4							86%											95%	92%	92%
CO - 5										86%			86%					95%	92%	92%
CO - 6				86%												86%		95%	92%	100%

CO	Subj	obj	aasg	ppt	Overall	Level
CO-1						
CO-2						
CO-3	86%	95%	92%	92%	91%	3
CO-4	86%	95%	92%	92%	91%	3.00
CO-5	86%	95%	92%	92%	91%	3.00
CO-6	86%	95%	92%	100%	93%	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 / I
Course Name:	M&C		

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

		Attainment Level	% students
Class Average mark	24		
Number of students performed above the target	31	1	40%
Number of successful students	62	2	50%
Percentage of students scored more than target	50%	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:	I Internal
Course Name:	M&C	Year:	I
		Semester:	I

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:	M&C	Semester:	I

CO-PO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2		1	1							1		
CO2	3	2		1	1							1		
CO3	2	2		1	1							1		
CO4	2	3		1	1							2		
CO5	3	2		1	1							2		
CO6	3	2		1	1							2		
Course	**2.67**	**2.17**		**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	**2.04**	**1.66**		**0.77**	**0.77**							**1.15**

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

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

ATTENDANCE REGISTER

Attendance Link :

https://drive.google.com/file/d/1WH73S_LC5ofUeH8xKsJ0bVj9liDuGNay/view?usp=sharing