DEPARTMENT OF AEROSPACE ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor   : I.Dakshina Murthy
Course Name & Code   : Elements of Aerospace Engineering 20AE01
L-T-P Structure   : 3-0-0   Credits : 3
Program/Sem/Sec   : B.Tech., II-Sem.   A.Y   : 2022-2022

PRE-REQUISITE: -

Course Educational Objectives: To learn the components of aeroplane and different types of flight vehicles, the basic aspects of aerodynamics and airfoils, the elements of propulsive systems, functions of structural components in wing and fundamental aspects of flight vehicle in space.

COURSE OUTCOMES (COs): At the end of the semester, students are able to

CO 1	Describe functions of various external and internal components of an airplane.
CO 2	Classify the various forces and moments acting on an airfoil.
CO 3	Describe the working principles of various aircraft engine systems.
CO 4	Describe the basic aspects of space flight.

Course Code	COs	Programme Outcomes												PSOs	
		1	2	3	4	5	6	7	8	9	10	11	12	1	2
S120	CO1	3	3	1	2	-	-	2	-	-	1	2	3	3	2
	CO2	3	3	1	2	-	-	2	-	-	1	2	3	3	2
	CO3	3	3	1	2	-	-	2	-	-	1	2	3	3	2
	CO4	3	3	1	2	2	-	2	-	-	1	2	3	3	2
1 = Slight (Low)		**2 = Moderate (Medium)**				**3-Substantial (High)**									

Note: Enter Correlation Levels **1** or **2** or **3.**If there is no correlation, **put '-'1-** Slight (Low), **2** – Moderate (Medium), **3 -** Substantial (High).

TEXT BOOKS:

 T1   Anderson. J.D, Introduction to flight, Eight Edition, McGraw-Hill Education, 2017.

REFERENCE BOOKS:

 R1   Houghton. E.L., Carpenter, P.W Aerodynamics for engineering students, seventh edition.

 R2   Kermode. A.C, Mechanics of flight, Eleventh edition, Pearson education, 2007.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: BASIC ASPECTS

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	History	1	02-05-2022		TLM2	
2.	Components of airplane	1	04-05-2022		TLM2	
3.	Types of flight vehicles	1	05-05-2022		TLM2	
4.	Tutorial-1	1	06-05-2022		TLM2	
5.	Altitudes, hydrostatic equation	1	09-05-2022		TLM2	
6.	Standard atmosphere	1	11-05-2022		TLM2	
7.	Problems	1	12-05-2022		TLM2	
8.	Tutorial-2	2	13-05-2022 16-05-2022		TLM3	
9.	Assignment-1	1	18-05-2022		TLM2	
No. of classes required to complete UNIT-I: 10				No. of classes taken:		

UNIT-II: BASIC AERODYNAMICS

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction, airfoils	1	19-05-2022		TLM2	
2.	Airfoil nomenclature, classifications	1	20-05-2022		TLM2	
3.	Tutorial-3	1	23-05-2022		TLM3	
4.	Wing geometry, aerodynamic forces	1	25-05-2022		TLM2	
5.	Aerodynamic centre, co-efficient of pressure	1	26-05-2022		TLM2	
6.	Pressure distribution over airfoil	1	27-05-2022		TLM2	
7.	Types of drag	1	30-05-2022		TLM2	
8.	Tutorial-4	1	01-06-2022		TLM2	
9.	Assignment-2	1	02-06-2022		TLM2	
10.	Revision of unit-1 and 2	1	03-06-2022		TLM2	
No. of classes required to complete UNIT-II: 10				No. of classes taken:		

UNIT-III: PROPULSION

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction, Propeller, Reciprocating engine	3	06-06-2022 08-06-2022 09-06-2022		TLM2	
2.	Jet propulsion- the thrust equation	3	10-06-2022 13-06-2022 15-06-2022		TLM2	
3.	Elements of turbojet and turbofan engines	2	16-06-2022 17-06-2022		TLM2	
4.	Rocket engine, liquid propellants and solid propellants, Rocket staging and Assignment -3	3	27-06-2022 29-06-2022 30-06-2022		TLM2	
No. of classes required to complete UNIT-III: 11				No. of classes taken:		

Mid-1	20-06-2022 to 25-06-2022

UNIT-IV: FLIGHT VEHICLE STRUCTURES

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction, Fuselage-monocoque, semi-monocoque structures	2	01-07-2022 04-07-2022		TLM1	
2.	Components of wing-spars, ribs, longerons, stringers, bulkheads	2	06-07-2022 07-07-2022		TLM1	
3.	Aircraft materials- metallic and non-metallic materials	1	08-07-2022		TLM1	
4.	Use of aluminium alloy, titanium, use of stainless steel and composite materials	1	11-07-2022		TLM1	
5.	Revision & Assignment-4	4	13-07-2022 14-07-2022 15-07-2022 18-07-2022		TLM1	
No. of classes required to complete UNIT-IV:10				No. of classes taken:		

UNIT-V: SPACE FLIGHT

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction, Orbit equation, basic aspects of space vehicle trajectories	2	20-07-2022 21-07-2022		TLM1	
2.	Kepler's laws	2	22-07-2022 25-07-2022		TLM1	

3.	Earth and planetary entry	1	27-07-2022		TLM1	
4.	Space explorations- space vehicles and its types, reusable space vehicles, space shuttle satellites	2	28-07-2022 29-07-2022		TLM1	
5.	Types of satellites and their functions, Assignment-5	2	01-08-2022 03-08-2022		TLM1	
6.	Revision (Cycle 1)	2	04-08-2022 05-08-2022 08-08-2022			
7.	Revision (Cycle 2)	2	10-08-2022 11-08-2022 12-08-2022			
No. of classes required to complete UNIT-V:11				No. of classes taken:		

Mid-2	15-08-2022 to 20-08-2022

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

PART-C

EVALUATION PROCESS (R20 Regulations):

Evaluation Task	Marks
Assignment-I (Units-I, II & UNIT-III (Half of the Syllabus))	A1=5
I-Descriptive Examination (Units-I, II & UNIT-III (Half of the Syllabus))	M1=15
I-Quiz Examination (Units-I, II & UNIT-III (Half of the Syllabus))	Q1=10
Assignment-II (Unit-III (Remaining Half of the Syllabus), IV & V)	A2=5
II- Descriptive Examination (UNIT-III (Remaining Half of the Syllabus), IV & V)	M2=15
II-Quiz Examination (UNIT-III (Remaining Half of the Syllabus), IV & V)	Q2=10
Mid Marks =80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE) : M	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	To apply the knowledge of Aerodynamics, Propulsion, Aircraft structures and Flight Dynamics in the Aerospace vehicle design
PSO 2	To prepare the students to work effectively in the defense and space research programs

Course Instructor   Module Coordinator   HOD

I.Dakshina Murthy   Dr. P. Lovaraju   Dr. P. Lovaraju

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)
Accredited by NAAC & NBA (Under Tier - I), ISO 9001:2015 Certified Institution
Approved by AICTE, New Delhi. and Affiliated to JNTUK, Kakinada
L.B. REDDY NAGAR, MYLAVARAM, KRISHNA DIST., A.P.-521 230.
Phone: 08659-222933, Fax: 08659-222931

FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT
PART-A

PROGRAM/SEM/SEC	**:** I B. Tech., II-Sem., ASE
ACADEMIC YEAR	**:** 2021-22
COURSE NAME & CODE	**:** Linear algebra & Transformation Techniques&20FE04
L-T-P STRUCTURE	**:** 3-1-0
COURSE CREDITS	**:** 3
COURSE INSTRUCTOR	**:** Dr. K.R. Kavitha
COURSE COORDINATOR	**:** Dr. K. Jhansi Rani
PRE-REQUISITES	**:** Nil

COURSE EDUCATIONAL OBJECTIVES (CEOs): In this course the students learn Matrix algebra and introduced with transformation techniques such as Laplace transformation and Z – Transformations.

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

CO1	Investigate the consistency of the system of equations and solve them. (Apply L3)
CO2	Determine the Eigen vectors and inverse, powers of a matrix by using Cayley – Hamilton theorem. (Apply L3)
CO3	Use the concepts of Laplace transforms to various forms of functions.(Understand L2)
CO4	Solve Ordinary differential equations by using Laplace Transformations. (Apply L3)
CO5	Apply Z- Transformations to solve difference equations. (Apply L3)

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

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	-	2	-	-	-	-	-	-	-	1			
CO2	3	2	-	2	-	-	-	-	-	-	-	1			
CO3	3	2	-	2	-	-	-	-	-	-	-	1			
CO4	2	1	-	1	-	-	-	-	-	-	-	1			
CO5	3	2	-	2	-	-	-	-	-	-	-	1			
	1 - Low				**2 –**Medium					**3 -** High					

TEXTBOOKS:

T1 Dr. B.S. Grewal, "Higher Engineering Mathematics", 42ndEdition, Khanna Publishers, New Delhi, 2012.

T2 Dr. B. V. Ramana, "Higher Engineering Mathematics", 1stEdition, TMH, New Delhi, 2010.

REFERENCE BOOKS:

R1 M. D. Greenberg, "Advanced Engineering Mathematics", 2nd Edition, TMH Publications, New Delhi, 2011.

R2 Erwin Kreyszig, "Advanced Engineering Mathematics", 8th Edition, John Wiley & sons, New Delhi, 2011.

R3 W.E. Boyce and R. C. Diprima, " Elementary Differential Equations" , 7th Edition, John Wiley & sons, New Delhi,2011.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to the course, Course Outcomes	1	04/05/22		TLM1	

UNIT-I: Linear System of Equations

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
2.	Introduction to the course, Course Outcomes	1	05/05/22		TLM1	
3.	Introduction to UNIT I	1	07/05/22		TLM2	
4.	Echelon form of a matrix	1	10/05/22		TLM1	
5.	Normal form of a matrix	1	11/05/22		TLM1	
6.	Normal form of a matrix	1	12/05/22		TLM1	
7.	PAQ form	1	14/05/22		TLM1	
8.	Solution of Homogeneous linear system of equations	1	17/05/22		TLM1	
9.	Solution of Non homogeneous Linear system of equations	1	18/05/22		TLM1	
10.	Solution of Non homogeneous Linear system of equations	1	19/05/22		TLM1	
11.	**Tutorial 1**	1	21/05/22		TLM3	
12.	Solution of homogeneous Linear system of equations	1	24/05/22		TLM1	
No. of classes required to complete UNIT-I: 11				**No. of classes taken:**		

UNIT-II: Eigen values and Eigen Vectors

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
13.	Introduction to UNIT II	1	25/05/22		TLM2	
14.	Eigen values of a matrix	1	26/05/22		TLM1	
15.	Eigen values and Eigen vectors of a matrix.	1	28/05/22		TLM1	
16.	Eigen values and Eigen vectors of a matrix.	1	31/05/22		TLM1	
17.	Properties	1	01/06/22		TLM1	
18.	Properties		02/06/22			
19.	Cayley – Hamilton Theorem.	1	04/06/22		TLM1	
20.	Inverse and powers of a matrix by using Cayley – Hamilton Theorem.	1	07/06/22		TLM1	
21.	Inverse and powers of a matrix by using Cayley – Hamilton Theorem.	1	08/06/22		TLM1	
22.	**Tutorial 2**	1	11/06/22		TLM3	
No. of classes required to complete UNIT-II: 10				**No. of classes taken:**		

UNIT-III: Laplace Transforms

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
23.	Introduction to Unit-III	1	09/06/22		TLM2	
24.	Standard forms of Laplace Transforms.	1	14/06/22		TLM1	
25.	Linear Property, Shifting Theorem.	1	15/06/22		TLM1	
26.	Change of scale property, Multiplication by t.	1	16/06/22		TLM1	
27.	Multiplication by t.	1	18/06/22		TLM1	
II MID EXAMINATIONS (20-06-2022 TO 25-06-2022)						

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
28.	Division by t	1	28/06/22		TLM1	
29.	Laplace transforms of derivatives.	1	29/06/22		TLM 1	
30.	Laplace transforms of Integrals.	1	30/06/22		TLM1	
31.	**Tutorial 3**	1	02/07/22		TLM3	
32.	Unit step function and Dirac's delta function.	1	05/07/22		TLM1	
33.	Application of Laplace Transforms.	1	06/07/22		TLM1	
No. of classes required to complete UNIT-III: 11				**No. of classes taken:**		

UNIT-IV: Inverse Laplace Transforms

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
34.	Introduction to UNIT IV.	1	07/07/22		TLM2	
35.	Linear property.	1	09/07/22		TLM1	
36.	Shifting properties.	1	12/07/22		TLM1	
37.	Inverse Laplace transform by using partial fractions.	1	13/07/22		TLM1	
38.	Inverse Laplace transform by using partial fractions.	1	14/07/22		TLM1	
39.	Inverse Laplace Transform by using Convolution theorem.	1	16/07/22		TLM1	
40.	Inverse Laplace Transform by using Convolution theorem.	1	19/07/22		TLM1	
41.	Solving of Ordinary differential equation by Laplace transform method.	1	20/07/22		TLM1	
42.	Solving of Ordinary differential equation by Laplace transform method.	1	21/07/22		TLM1	
43.	**Tutorial 4**	1	23/07/22		TLM3	
No. of classes required to complete UNIT-IV: 10				**No. of classes taken:**		

UNIT-V: Z- Transforms

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
44.	Introduction to UNIT V.	1	26/07/22		TLM2	
45.	Standard forms of Z- Transform.	1	27/07/22		TLM1	
46.	Damping rule	1	28/07/22		TLM1	
47.	Shifting Rule	1	30/07/22		TLM1	
48.	Initial and final value theorems.	1	02/08/22		TLM1	
49.	Inverse Z – Transfroms by using partial fractions.	1	03/08/22		TLM1	
50.	Inverse Z – Transform by using convolution theorem.	1	04/08/22		TLM1	
51.	Solving of Difference equations by using Z – Transforms.	1	06/08/22		TLM1	
52.	Solving of Difference equations by using Z – Transforms.	1	10/08/22		TLM1	
53.	**Tutorial 5**	1	13/08/22		TLM3	
No. of classes required to complete UNIT-V:10				**No. of classes taken:**		

Contents beyond the Syllabus

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
54.	Solving of PDE other methods	1	11/08/22		TLM2	

II MID EXAMINATIONS (15-08-2022 TO 20-08-2022)

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

EVALUATION PROCESS (R17 Regulation):

Evaluation Task	Marks
Assignment-I (Units-I, II & UNIT-III (Half of the Syllabus))	A1=5
I-Descriptive Examination (Units-I, II & UNIT-III (Half of the Syllabus))	M1=15
I-Quiz Examination (Units-I, II & UNIT-III (Half of the Syllabus))	Q1=10
Assignment-II (Unit-III (Remaining Half of the Syllabus), IV & V)	A2=5
II- Descriptive Examination (UNIT-III (Remaining Half of the Syllabus), IV & V)	M2=15
II-Quiz Examination (UNIT-III (Remaining Half of the Syllabus), IV & V)	Q2=10
Mid Marks =80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE): M	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of and need for sustainable development.
PO 8	**Ethic**s: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Dr. K.R. Kavitha	Dr. K. Jhansi Rani	Dr. A. Rami Reddy	Dr. A. Rami Reddy
Signature				

FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

PART-A

PROGRAM	: B.Tech., II-Sem., ASE
ACADEMIC YEAR	: 2021-22
COURSE NAME & CODE	: ENGINEERING PHYSICS & 20FE08
L-T-P STRUCTURE	: 3-1-0
COURSE CREDITS	: 3
COURSE INSTRUCTOR	: Dr. S. Yusub
COURSE COORDINATOR	: Dr. P.V.N. Kishore
PRE-REQUISITE	: Nil

COURSE EDUCATIONAL OBJECTIVES (CEOs): It enables the students to understand the fundamental concepts ofoptics, quantum mechanics, free electron theory of metals, semiconductors, dielectrics, and their applications.

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

CO 1	**Analyse** the different mechanical properties of materials (Understand-L2).
CO 2	**Apply** the Lasers and Optical Fibers in different fields (Apply-L3).
CO 3	**Summarize** the properties of sound waves (Understand-L2).
CO 4	**Classify** the different types of magnetic and dielectric materials (Understand-L2).
CO5	**Identify** the properties of superconducting and nano materials (Understand-L2).

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

ENGINEERING PHYSICS												
COURSE DESIGNED BY	**FRESHMAN ENGINEERING DEPARTMENT**											
Course Outcomes PO's →	**Programme Outcomes**											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1.	3	3	1	1	1	1	1					1
CO2.	3	3	2	1	1	1	1					1
CO3.	3	3	1	1	1	1						1

CO4.	**3**	**3**	**1**	**1**	1	1	1					**1**
CO5.	**3**	**3**	**1**	**1**	1	1						**1**
1 = slight (Low) **2 = Moderate (Medium)** **3 = Substantial (High)**											

BOS APPROVED TEXT BOOKS:

  T1 : V. Rajendran, "*Engineering Physics*", TMH, New Delhi, 6th Edition, 2014.
  T2 :M.N. Avadhanulu, P.G. Kshirsagar, "Engineering *Physics*", S. Chand &Co., 2nd Edition, 2014.

BOS APPROVED REFERENCE BOOKS:

  R1: M.N. Avadhanulu, TVS Arun Murthy, "Applied *Physics*", S. Chand & Co., 2nd Edition, 2007.
  R2 : P.K. Palani Samy, "*Applied Physics*", Sci. Publ. Chennai, 4th Edition, 2016.
  R3 : P. Sreenivasa Rao, K Muralidhar, "*Applied Physics*", Him. Publi. Mumbai,1st Edition, 2016.
R4 : Hitendra K Mallik , AK Singh " *Engineering Physics*", TMH, New Delhi, 1st Edition, 2009.

<u>**WEB REFERENCES AND E-TEXT BOOKS**</u>

1. http://www.freebookcentre.net/Physics/Solid-State-Physics-Books.html

2. http://physicsdatabase.com/free-physics-books/

3. http://www.e-booksdirectory.com

4. http://www.thphys.physics.ox.ac.uk

TEACHING LEARNING METHODS			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

<u>**PART-B**</u>

COURSE DELIVERY PLAN (LESSON PLAN):

<u>**UNIT-I: ELASTICITY**</u>

Course Outcome:- CO 1; Text Book :- T1, R4

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign	Remarks
1.	Introduction to the Subject, Course Outcomes	1	02/05/2022		**TLM1**		
2.	General Properties of matter	1	04/05/2022		**TLM1**		
3.	Introduction to Elasticity /Plasticity	1	06/05/2022		**TLM1**		
4.	TUTORIAL-1	1	07/05/2022		**TLM3**		
5.	Introduction on Stress, strain and their classification	1	09/05/2022		**TLM1**		
6.	Hook's law, Elastic behavior of a material, Factors affecting elasticity	1	11/05/2021		**TLM1**		
7.	Classification of Elastic modulii	1	13/05/2022		**TLM2**		
8.	TUTORIAL-2	1	14/05/2022		**TLM3**		
9.	Relation between Y, K, n and σ	1	16/05/2022		**TLM2**		
10.	Problems &Assignment/Quiz	1	18/05/2022		**TLM4**		
11.	Bending of beams expression, Cantilever	1	20/05/2022		**TLM3**		
12.	TUTORIAL-3	1	21/05/2022		**TLM3**		
No. of classes required to complete UNIT-I: 11				No. of classes taken:			

UNIT-II: LASERS & OPTICAL FIBERS

Course Outcome: - CO 2; Text Book: - T1, R4

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign	Remarks
1.	Principle of laser, Absorption, Spontaneous and Stimulated emission	1	23/05/2022		**TLM2**		

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign	Remarks
2.	Einstein Coefficients	1	25/05/2022		**TLM2**		
3.	Nd-YAG Laser, He-Ne gas Laser	1	27/05/2022		**TLM2**		
4.	TUTORIAL-4	1	28/05/2022		**TLM3**		
5.	Applications of LASERS	1	30/05/2022		**TLM5**		
6.	Optical Fiber principle, Structure of optical fiber	1	01/06/2022		**TLM2**		
7.	Numerical aperture and Acceptance angle	1	03/06/2022		**TLM4**		
8.	TUTORIAL-5	1	04/06/2022		**TLM3**		
9.	Types of optical fibers, Applications	1	06/06/2022		**TLM2**		
10.	Problems &Assignment/Quiz	1	08/06/2022		**TLM5**		
No. of classes required to complete UNIT-II: 10			No. of classes taken:				

UNIT-III: ACOUSTICS & ULTRASONICS

Course Outcome: - CO 3; Text Book: - T1, R4

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign	Remarks
1.	Introduction to Acoustics	1	10/06/2022		**TLM5**		
2.	TUTORIAL-6	1	11/06/2022		**TLM3**		
3.	Reverberation-reverberation time, Sabine's formula	1	13/06/2022		**TLM2**		
4.	Sabine's formula	1	15/06/2022		**TLM2**		
5.	Absorption co-efficient and its determination,	1	17/06/2022		**TLM2**		
6.	Problems & Assignment /Quiz	1	18/06/2022		**TLM2**		
7.	**MID-1 Exams**		20/06/2022 to 25/06/2022				
8.	Introduction to Ultrasonics	1	27/06/2022		**TLM2**		
9.	Production & detection of Ultrasonics	1	29/06/2022		**TLM3**		
10.	Non-destructive testing through transmission	1	01/07/2022		**TLM2**		

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign	Remarks
	method & pulse-echo method						
11.	TUTORIAL-7	1	02/07/2022		TLM3		
12.	Discussion on various applications of Ultrasonics	1	04/07/2022		TLM2		
13.	Problems &Assignment/Quiz	1	06/07/2022		TLM2		
No. of classes required to complete UNIT-III: 12				No. of classes taken:			

UNIT-IV : <u>MAGNETIC & DIELECTRIC MATERIALS</u>

Course Outcome:- CO 4; Text Book :- T2, R4

S.No	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign	Remarks
1.	Introduction, Magnetic parameters	1	08/07/2022		TLM2		
2.	TUTORIAL-8	1	09/07/2022		TLM3		
2.	Classification of magnetic materials – Dia, para & Ferro	1	11/07/2022		TLM6		
4.	Hysteresis loop, Soft and hard magnetic materials	1	13/07/2022		TLM2		
5.	Applications of magnetic materials	1	15/07/2022		TLM2		
6.	TUTORIAL-9	1	16/07/2022		TLM3		
7.	Basic Definitions, Electronic polarization	1	18/07/2022		TLM2		
8.	Ionic & Orientation polarization	1	20/07/2022		TLM1		
10.	Local field,Clausius Mosotti equation	1	22/07/2022		TLM2		
11.	TUTORIAL-10	1	23/07/2022		TLM3		
12.	Applications of dielectricmaterials	1	25/07/2022		TLM2		
13.	Problems & Assignment/Quiz	1	27/07/2022		TLM2		
No. of classes required to complete UNIT-IV: 12				No. of classes taken:			

UNIT-V: <u>SUPERCONDUCTORS & NANO-MATERIALS</u>

Course Outcome:- CO 5; Text Book :- T2, R4

S.No.	Topics to be covered	No. of Classes	Tentative Date of	Actual Date of	Teaching Learning	HOD Sign	Remarks

			Required	Completion	Completion	Methods		
1.	Introduction - Superconductivity		1	29/07/2022		**TLM6**		
2.	TUTORIAL-11		1	30/07/2022		**TLM3**		
3.	Meissner effect, Type-I &II conductors		1	01/08/2022		**TLM2**		
4.	Josephson effect, Applications of Superconductors		1	03/08/2022		**TLM2**		
5.	Problems &Assignment/Quiz		1	05/08/2022		**TLM2**		
6.	TUTORIAL-12		1	06/08/2022		**TLM3**		
7.	Introduction to Nano-materials		1	08/08/2022		**TLM5**		
8.	Classification and properties of Nano-materials		1	10/08/2022		**TLM2**		
9.	Discussion on different methods of preparation, applications		1	12/08/2022		**TLM2**		
10.	TUTORIAL-13		1	13/08/2022		**TLM3**		
No. of classes required to complete UNIT-V: 10					No. of classes taken:			

Contents beyond the Syllabus

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign
1.	SEM	1	08-08-2022		TLM1		R1	
2.	Energy sources	1	08-08-2022		TLM1		R1	
3.	Mid II	1	15-08-2022			CO3, CO4, CO5		
4.	Mid II	1	16-08-2022			CO3, CO4, CO5		
5.	Mid II	1	17-08-2022			CO3, CO4, CO5		
6.	Mid II	1	18-08-2022			CO3, CO4, CO5		
7.	Mid II	1	19-08-2022			CO3, CO4, CO5		
8.	Preparation and Practicals	22-08-2022 to 27-08-2022						
9.	Semester end examinations	29-08-2022 to 10-09-2022						

PART-C

EVALUATION PROCESS (R-20 Regulation):

Evaluation Task	Marks
Assignment-I (Unit-I)	A1=5
Assignment-II (Unit-II)	A2=5
Assignment-III (Unit-III (A))	A3=5
I-Mid Examination (Units-I, II& III (A))	M-1=15
I-Quiz Examination (Units-I, II& III (A))	Q1=10
Assignment-III (Unit-III (B))	A3=5
Assignment-IV (Unit-IV)	A4=5
Assignment-V (Unit-V)	A5=5
II-Mid Examination (Units-III (B), IV & V)	M-2=15
II-Quiz Examination (Units-III (B), IV & V)	Q2=10
Assignment Marks = Best Four Average of A1, A2, A3, A4, A5	A=5
Mid Marks =75% of Max(M-1,M-2)+25% of Min(M-1,M-2)	M=15
Quiz Marks =75% of Max(Q-1,Q-2)+25% of Min(Q-1,Q-2)	Q=10
Cumulative Internal Examination (CIE): A+M+Q	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	**100**

PART-D

PROGRAMME OUTCOMES (POs):

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

PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Course Instructor   Course Coordinator   Module Coordinator   HOD

Dr. S. Yusub   Dr. P.V.N. Kishore   Dr. S. Yusub   Dr. A. Rami Reddy