B.Sc., MATHEMATICS

Syllabus

Program Code: UMT

2023-2024 onwards

MANNAR THIRUMALAI NAICKER COLLEGE

(AUTONOMOUS)

Re-accredited with "A" Grade by NAAC

PASUMALAI, MADURAI – 625 004

GUIDLINESS FOR OUTCOME BASED EDUCATION WITH CHOICE BASED CREDIT SYSTEM

(FOR UG PROGRAM FROM 2023 -2024 ONWARDS)

ELIGIBILITY FOR ADMISSION

Candidates seeking admission to the UG Degree program must have passed the Higher Secondary Education (respective groups – Arts / Science) of the Government of Tamil Nadu or any other state or its equivalent qualification.

DURATION OF THE COURSE

The duration of the course shall be three academic years comprising six semesters with two semesters in each academic year.

Subjects of Study

Part I : Tamil / Hindi /

Part II : English

Part III :

1.Core Subjects
2.Allied Subjects
3.Electives

Part IV:

1.Non Major Electives (I Year)
2.Skill Based Subjects
3.Environmental Studies - Mandatory Subject
4.Value Education - Mandatory Subject

Part V :

Extension Activities

ARTS & SCIENCE

CBCS COURSE STRUCTURE FOR UG PROGRAMS

Sem I	Credit	Sem II	Credit	Sem III	Credit	Sem IV	Credit	Sem V	Credit	Sem VI	Credit
1.1. Language - Tamil	3	2.1. Language - Tamil	3	3.1. Language - Tamil	3	4.1. Language - Tamil	3	5.1 Core Course – \CC IX	4	6.1 Core Course – CC XIII	4
1.2 English	3	2.2 English	3	3.2 English	3	4.2 English	3	5.2 Core Course – CC X	4	6.2 Core Course – CC XIV	4
1.3 Core Course – CC I	4	2.3 Core Course – CC III	4	3.3 Core Course – CC V	4	4.3 Core Course – CC VII Core Industry Module	4	5. 3.Core Course CC -XI	4	6.3 Core Course – CC XV	4
1.4 Core Course – CC II	4	2.4 Core Course – CC IV	4	3.4 Core Course – CC VI	4	4.4 Core Course – CC VIII	4	5. 3.Core Course –/ Project with viva-voce CC - XII	4	6.4 Elective -VII Generic/ Discipline Specific	3
1.5 Elective I Generic/ Discipline Specific	3	2.5 Elective II Generic/ Discipline Specific	3	3.5 Elective III Generic/ Discipline Specific	3	4.5 Elective IV Generic/ Discipline Specific	3	5.4 Elective V Generic/ Discipline Specific	3	6.5 Elective VIII Generic/ Discipline Specific	3
1.6 Skill Enhancement Course SEC-1 (NME)	2	2.6 Skill Enhancement Course SEC-2 (NME)	2	3.6 Skill Enhancement Course SEC-4, (Entrepreneurial Skill)	1	4.6 Skill Enhancement Course SEC-6	2	5.5 Elective VI Generic/ Discipline Specific	3	6.6 Extension Activity	1
1.7Ability Enhancement Compulsory Course (AECC) Soft Skill-1	2	2.7 Skill Enhancement Course – SEC-3(NME)	2	3.7 Skill Enhancement Course SEC-5	2	4.7 Skill Enhancement Course SEC-7	2	5.6 Value Education	2	6.7 Professional Competency Skill	2
1.8 Skill Enhancement - (Foundation Course)	2	2.8 Ability Enhancement Compulsory Course (AECC) Soft Skill-2	2	3.7 Ability Enhancement Compulsory Course (AECC) Soft Skill-3	2	4.7 7Ability Enhancement Compulsory Course (AECC) Soft Skill-4	2	5.5 Summer Internship /Industrial Training	2		
				3.8 E.V.S	-	4.8 E.V.S	2				
	23		**23**		**22**		**25**		**26**		**21**
	Total Credit Points										**140**

QUESTION PAPER PATTERN FOR THE CONTINUOUS INTERNAL ASSESSMENT

Note: Duration – 1 hour

(FOR PART I, PART II & PART III)

The components for continuous internal assessment are:

Part –A

Four multiple choice questions (answer all) 4 x01= 04 Marks

Part –B

Two questions (‘either …. or ‘type) 2 x05= 10 Marks

Part –C

Two questions (‘either …. or ‘type) 2 x 08=16 Marks

Total 30 Marks

THE COMPONENTS FOR CONTINUOUS INTERNAL ASSESSMENT ARE:

(60 Marks of two continuous internal assessments will be converted to 15 marks)

Two tests and their average --15 marks

Seminar /Group discussion / Quiz Test --5 marks

Assignment --5 marks

Total 25 Marks

QUESTION PAPER PATTERN FOR THE SUMMATIVE EXAMINATIONS:

Note: Duration- 3 hours

Part –A

Ten multiple choice questions	10 x01	= 10 Marks

No Unit shall be omitted: not more than two questions from each unit.)

Part –B

Five Paragraph questions (‘either …. or ‘type)	5 x 05	= 25 Marks

(One question from each Unit)

Part –C

Five Paragraph questions (‘either …. or ‘type)	5 x 08	= 40 Marks

(One question from each Unit)

Total	75 Marks

PART-IV- SKILL BASED PAPERS / NME:

The Scheme of Examination for Skill Based Papers: (Except Practical Lab Subjects)

QUESTION PAPER PATTERN FOR THE CONTINUOUS INTERNAL ASSESSMENT (SKILL BASED AND NME COURSES) DURATION – 1 HOUR

- 50 MCQs will be asked for each internal assessment tests (50 x 1=50 Marks) and converted for 15 marks

THE COMPONENTS FOR CONTINUOUS INTERNAL ASSESSMENT ARE:

Two tests and their average	--15 marks
Seminar /Group discussion / Quiz Test	-- 5 marks
Assignment	-- 5 marks
Total	25 Marks

SUMMATIVE EXAMINATION PATTERN (SKILL BASED AND NME COURSES) DURATION – 3 HOURS

Pattern of the Question Paper for Skill Based and Non-Major Elective courses (External)

75 Multiple choice questions will be asked from five units (75 x 1=75 Marks)

(15MCQ's from each unit)

PART-IV- ENVIRONMENTAL STUDIES AND VALUE EDUCATION

QUESTION PAPER PATTERN (INTERNAL ASSESSMENT)

Pattern of the Question Paper for Environmental Studies & Value Education (Internal)

50 MCQs will be asked for each internal assessment tests (50 x 1=50 Marks) and converted for 15 marks

Two tests and their average	--	15 marks
Project	--	10 marks

Total		25 Marks
		---

* The students as Individual or Group must visit a local area to document environmental assets – river / forest / grassland / hill / mountain – visit a local polluted site – urban / rural / industrial / agricultural – study of common plants, insects, birds – study of simple ecosystem – pond, river, hill slopes, etc.

SUMMATIVE EXAMINATION PATTERN

Pattern of the Question Paper for Environmental Studies & Value Education only) (External)

75 Multiple choice questions will be asked from five units (75 x 1=75 Marks)

(15MCQ's from each unit)

PART V EXTENSION ACTIVITIES: (MAXIMUM MARKS: 100)

1. NCC
2. NSS
3. Physical Education
4. YRC
5. RRC
6. Health & Fitness Club
7. Eco Club
8. Human Rights Club

Internal Examinations - - 25 Marks

Summative Examinations - - 75 Marks

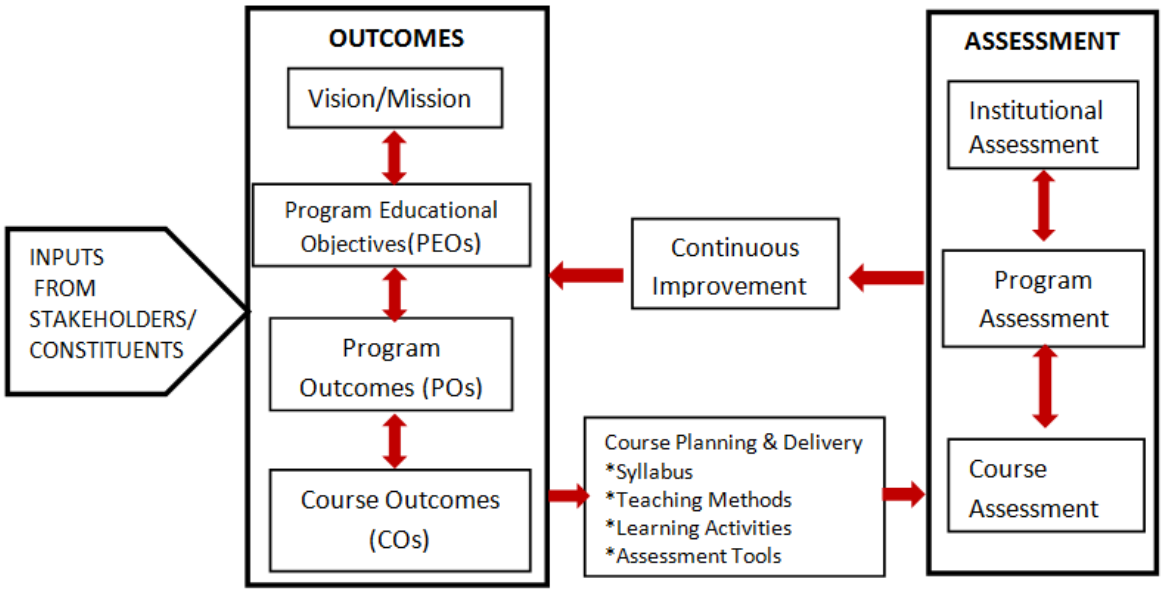
100

OUTCOME BASED EDUCATION:

OBE starts with the identification and articulation of clear and measurable learning outcomes for each course or program. These outcomes describe the skills, knowledge, and abilities that students are expected to acquire. The curriculum, instructional methods, and assessments are aligned with the defined learning outcomes. This ensures that everything taught and evaluated is directly related to what students are expected to learn.

The Learning Outcomes-Based Approach to curriculum planning and transaction in our institution ensures whether the teaching-learning processes are oriented towards enabling students to attain the defined learning outcomes relating to the courses within a programme. The outcome based approach, particularly in the context of undergraduate studies, requires a significant shift from teacher-centric to learner-centric pedagogies and from passive to active/participatory pedagogies.

Assessment Method: The students are assessed with 2 internal examination and the summative examination which includes problem based assignments; practical assignment laboratory reports; observation of practical skills; individual project reports ,case-study reports; team project reports; oral presentations, including seminar presentation; viva voce interviews; computerized adaptive testing; etc. and any other pedagogic approaches as per the context.



INSTITUTIONAL VISION

To Mould the learners into accomplished individuals by providing them with a stimulus for social change through character, confidence and competence.

INSTITUTIONAL MISSION

1. Enlightening the learners on the ethical and environmental issues.

2. Extending holistic training to shape the learners in to committed and competent citizens.

3. Equipping them with soft skills for facing the competitive world.

4. Enriching their employability through career oriented courses.

5. Ensuring accessibility and opportunity to make education affordable to the underprivileged.

Highlights of the Revamped Curriculum:

- Student-centric, meeting the demands of industry & society, incorporating industrial components, hands-on training, skill enhancement modules, industrial project, project with viva-voce, exposure to entrepreneurial skills, training for competitive examinations, sustaining the quality of the core components and incorporating application oriented content wherever required.
- The Core subjects include latest developments in the education and scientific front, advanced programming packages allied with the discipline topics, practical training, devising mathematical models and algorithms for providing solutions to industry / real life situations. The curriculum also facilitates peer learning with advanced mathematical topics in the final semester, catering to the needs of stakeholders with research aptitude.
- The General Studies and Mathematics based problem solving skills are included as mandatory components in the 'Training for Competitive Examinations' course at the final semester, a first of its kind.
- The curriculum is designed so as to strengthen the Industry-Academia interface and provide more job opportunities for the students.

- The Industrial Statistics course is newly introduced in the fourth semester, to expose the students to real life problems and train the students on designing a mathematical model to provide solutions to the industrial problems.
- The Internship during the second year vacation will help the students gain valuable work experience that connects classroom knowledge to real world experience and to narrow down and focus on the career path.
- Project with viva-voce component in the fifth semester enables the student, application of conceptual knowledge to practical situations. The state of art technologies in conducting a Explain in a scientific and systematic way and arriving at a precise solution is ensured. Such innovative provisions of the industrial training, project and internships will give students an edge over the counterparts in the job market.
- State-of Art techniques from the streams of multi-disciplinary, cross disciplinary and inter disciplinary nature are incorporated as Elective courses, covering conventional topics to the latest - Artificial Intelligence.

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MADURAI – 625 004
B.SC MATHEMATICS CURRICULUM
(For the student admitted during the academic year 2023-2024 onwards)

Course Code	Title of the Course	Hrs	Credits	Maximum Marks		
				Int	Ext	Total
FIRST SEMESTER						
Part – I	**Tamil / Alternative Course**					
23UTAGT11	தமிழ் இலக்கிய வரலாறு - I	6	3	25	75	100
Part – II	**English**					
23UENGE11	GENERAL ENGLISH - I	6	3	25	75	100
Part - III	**Core Courses**					
23UMTCC11	ALGEBRA AND TRIGONOMETRY	5	5	25	75	100
23UMTCC12	DIFFERENTIAL CALCULUS	4	4	25	75	100
Part - III	**Elective Courses**					
23UPHEA11	ALLIED PHYSICS - I	3	3	25	75	100
23UPHEP11	ALLIED PHYSICS PRACTICAL - I	2	1	25	75	100
Part IV	**Non Major Elective**					
23UMTNM11	MATHEMATICS FOR COMPETITIVE EXAMINATION - I	2	2	25	75	100
Part IV	**Foundation Course**					
23UMTFC11	FUNDAMENTALS OF MATHEMATICS	2	2	25	75	100
	Total	30	23	200	600	800
SECOND SEMESTER						
Part – I	**Tamil / Alternative Course**					
23UTAGT21	தமிழ் இலக்கிய வரலாறு – II	6	3	25	75	100
Part – II	**English**					
23UENGE21	GENERAL ENGLISH - II	6	3	25	75	100
Part - III	**Core Courses**					
23UMTCC21	ANALYTICAL GEOMETRY (TWO AND THREE DIMENSIONS)	5	5	25	75	100
23UMTCC22	INTEGRAL CALCULUS	4	4	25	75	100
Part - III	**Elective Course**					
23UPHEA21	ALLIED PHYSICS - II	3	3	25	75	100
23UPHEP21	ALLIED PHYSICS PRACTICAL - II	2	1	25	75	100
Part IV	**Non Major Elective**					
23UMTNM21	MATHEMATICS FOR COMPETITIVE EXAMINATION - II	2	2	25	75	100
Part IV	**Skill Enhancement course**					
23UMTSP21	OFFICE AUTOMATION - LAB	2	2	25	75	100
	Total	30	23	200	600	800


FIRST SEMESTER

Course Name	ALGEBRA AND TRIGONOMETRY			
Course Code	23UMTCC11	**L**	**P**	**C**
Category	CORE	5	-	5

COURSE OBJECTIVES:

- Basic ideas on the Theory of Equations, Matrices and Number Theory.
- Knowledge to find expansions of trigonometry functions, solve theoretical and applied problems.

UNIT - I **15**

Reciprocal Equations-Standard form–Increasing or decreasing the roots of a given equation- Removal of terms, Approximate solutions of roots of polynomials by Horner's method – related problems.

UNIT - II **15**

Summation of Series: Binomial– Exponential –Logarithmic series (Theorems without proof) – Approximations - related problems

UNIT - III **15**

Characteristic equation – Eigen values and Eigen Vectors-Similar matrices - Cayley – Hamilton Theorem (Statement only) - Finding powers of square matrix, Inverse of a square matrix up to order 3, Diagonalization of square matrices - related problems.

UNIT - IV **15**

Expansions of $\sin n\theta$, $\cos n\theta$ in powers of $\sin\theta$, $\cos\theta$ - Expansion of $\tan n\theta$ in terms of $\tan\theta$, Expansions of $\cos^n\theta$, $\sin^n\theta$, $\cos^m\theta\sin^n\theta$ –Expansions of $\tan(\theta_1+\theta_2+,\ldots,+\theta_n)$-Expansions of $\sin\theta$, $\cos\theta$ and $\tan\theta$ in terms of θ - related problems

UNIT - V **15**

Hyperbolic functions – Relation between circular and hyperbolic functions Inverse hyperbolic functions, Logarithm of complex quantities, Summation of trigonometric series - related problems.

Total Lecture Hours	**75**

BOOKS FOR STUDY:

- W.S. Burnstine and A.W. Panton, Theory of equations
- David C. Lay, Linear Algebra and its Applications, 3rd Ed., Pearson Education Asia, Indian Reprint, 2007
- G.B. Thomas and R.L. Finney, Calculus, 9th Ed., Pearson Education, Delhi, 2005
- C. V. Durell and A. Robson, Advanced Trigonometry, Courier Corporation, 2003
- J. Stewart, L. Redlin, and S. Watson, Algebra and Trigonometry, Cengage Learning, 2012.
- Calculus and Analytical Geometry, G.B. Thomas and R. L. Finny, Pearson Publication, 9th Edition, 2010.

BOOKS FOR REFERENCES:

- Algebra, Volume I by T.K.Manicavachagom Pillay, T.Natarajan,K.S.Ganapathy, Viswanathan Publication 2007,
- Algebra, Volume II by T.K.Manicavachagom Pillay,T.Natarajan, K.S.Ganapathy, Viswanathan Publication 2008
- Trigonometry by P.Duraipandian and Kayalal Pachaiyappa,Muhil publishers

WEB RESOURCES:

- **https://nptel.ac.in**
- **https;//www.mathwarehous.com/**
- **https;//www.mathhelp.com/**
- **https;//www.mathsisfun.com/**

Nature of Course	EMPLOYABILITY	✓	SKILL ORIENTED		ENTREPRENEURSHIP			
Curriculum Relevance	LOCAL		REGIONAL		NATIONAL	✓	GLOBAL	
Changes Made in the Course	Percentage of Change	**40**	No Changes Made		New Course			

*** Treat 20% as each unit (20*5=100%) and calculate the percentage of change for the course.**

COURSE OUTCOMES:		K LEVEL
After studying this course, the students will be able to:		
CO1	Classify and Solve reciprocal equations	K1 to K4
CO2	Find the sum of binomial, exponential and logarithmic series	K1 to K4
CO3	Find Eigen values, eigen vectors, verify Cayley – Hamilton theorem and diagonalize a given matrix	K1 to K4
CO4	Expand the powers and multiples of trigonometric functions in terms of sine and cosine	K1 to K4
CO5	Determine relationship between circular and hyperbolic functions and the summation of trigonometric series	K1 to K4

MAPPING WITH PROGRAM OUTCOMES:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	1	3	-	-	-				
CO2	2	1	3	1	-	-				
CO3	3	1	3	1	-	-				
CO4	3	1	3	-	-	-				
CO5	3	1	3	-	-	-				

S- STRONG M – MEDIUM L - LOW

CO / PO MAPPING:

COS	PSO1	PSO2	PSO3	PSO4	PSO5
CO 1	3	2	1		
CO 2	3	2	1		
CO 3	3	2	1		
CO 4	3	2	1		
CO 5	3	2	1		
WEIGHTAGE	15	10	5		
WEIGHTED PERCENTAGE OF COURSE CONTRIBUTION TO POS	3	2	1		

LESSON PLAN:

UNIT	ALGEBRA & TRIGONOMETRY	HRS	PEDAGOGY
I	Reciprocal Equations-Standard form–Increasing or decreasing the roots of a given equation- Removal of terms, Approximate solutions of roots of polynomials by Horner's method – related problems.	15	Chalk & Talk
II	Summation of Series: Binomial– Exponential –Logarithmic series (Theorems without proof) – Approximations - related problems	15	Chalk & Talk
III	Characteristic equation – Eigen values and Eigen Vectors-Similar	15	Chalk &

	matrices - Cayley – Hamilton Theorem (Statement only) - Finding powers of square matrix, Inverse of a square matrix up to order 3, Diagonalization of square matrices - related problems		**Talk**
IV	Expansions of sinnθ, cosnθ in powers of sinθ, cosθ - Expansion of tannθ in terms of tan θ, Expansions of $\cos^n\theta$, $\sin^n\theta$, $\cos^m\theta\sin^n\theta$ –Expansions of $\tan(\theta_1+\theta_2+,\ldots,+\theta_n)$-Expansions of sinθ, cosθ and tanθ in terms of θ - related problems.	**15**	**Chalk & Talk**
V	Hyperbolic functions – Relation between circular and hyperbolic functions Inverse hyperbolic functions, Logarithm of complex quantities, Summation of trigonometric series - related problems.	**15**	**Chalk & Talk**

Learning Outcome Based Education & Assessment (LOBE)
Formative Examination - Blue Print
Articulation Mapping – K Levels with Course Outcomes (COs)

Internal	Cos	K Level	Section A		Section B Either or Choice	Section C Either or Choice
			MCQs			
			No. of. Questions	K - Level		
CI AI	CO1	K1 – K4	2	K1,K2	2(K2,K2)	2(K3,K3)
	CO2	K1 – K4	2	K1,K2	2(K3,K3)	2(K4,K4)
CI AII	CO3	K1 – K4	2	K1,K2	2(K2,K2)	2(K3,K3)
	CO4	K1 – K4	2	K1,K2	2(K3,K3)	2(K4,K4)
Question Pattern CIA I & II		No. of Questions to be asked	4		4	4
		No. of Questions to be answered	4		2	2
		Marks for each question	1		5	8
		Total Marks for each section	4		10	16

Distribution of Marks with K Level CIA I & CIA II							
	K Level	Section A (Multiple Choice Questions)	Section B (Either / Or Choice)	Section C (Either / Or Choice)	Total Marks	% of (Marks without choice)	Consolidate of %
CIA I	K1	2			2	3.6	25
	K2	2	10		12	21.4	
	K3		10	16	26	46.4	46.4
	K4			16	16	28.6	28.6
	Marks	4	20	32	56	100	100
CIA II	K1	2			2	3.6	7.2
	K2	2	10		2	3.6	
	K3		10	16	26	46.4	46.4
	K4			16	26	46.4	46.4
	Marks	4	20	32	56	100	100

K1- Remembering and recalling facts with specific answers

K2- Basic understanding of facts and stating main ideas with general answers

K3- Application oriented- Solving Problems

K4- Examining, analyzing, presentation and make inferences with evidences

CO5 will be allotted for individual Assignment which carries five marks as part of CIA component.

Summative Examination – Blue Print Articulation Mapping – K Level with Course Outcomes (COs)						
S. No	Cos	K - Level	Section A (MCQs)		Section B (Either / or Choice) With K - LEVEL	Section C (Either / or Choice) With K - LEVEL
			No. of Questions	K – Level		
1	CO1	K1 – K4	2	K1,K2	2(K2,K2)	2(K3,K3)
2	CO2	K1 – K4	2	K1,K2	2(K3,K3)	2(K4,K4)
3	CO3	K1 – K4	2	K1,K2	2(K2,K2)	2(K3,K3)
4	CO4	K1 – K4	2	K1,K2	2(K3,K3)	2(K4,K4)
5	CO5	K1 – K4	2	K1,K2	2(K3,K3)	2(K4,K4)
No. of Questions to be Asked			10		10	10
No. of Questions to be answered			10		5	5
Marks for each question			1		5	8
Total Marks for each section			10		25	40
(Figures in parenthesis denotes, questions should be asked with the given K level)						

Distribution of Marks with K Level						
K Level	**Section A (Multiple Choice Questions)**	**Section B (Either or Choice**	**Section C (Either/ or Choice)**	**Total Marks**	**% of (Marks without choice)**	**Consolidated %**
K1	**5**			**5**	**3.6**	**4**
K2	**5**	**20**		**25**	**17.8**	**18**
K3		**30**	**32**	**62**	**44.3**	**44**
K4			**48**	**48**	**34.3**	**34**
Marks	**10**	**50**	**80**	**140**	**100**	**100**
NB: Higher level of performance of the students is to be assessed by attempting higher level of K levels.						

Summative Examinations - Question Paper – Format

Q. No.	**Unit**	**CO**	**K-level**		
Answer **ALL** the questions				**PART – A**	**(10 x 1 = 10 Marks)**
1.	**Unit - I**	**CO1**	**K1**		
				a)	b)
				c)	d)
2.	**Unit - I**	**CO1**	**K2**		
				a)	b)
				c)	d)
3.	**Unit - II**	**CO2**	**K1**		
				a)	b)
				c)	d)
4.	**Unit - II**	**CO2**	**K2**		
				a)	b)
				c)	d)
5.	**Unit - III**	**CO3**	**K1**		
				a)	b)
				c)	d)
6.	**Unit - III**	**CO3**	**K2**		
				a)	b)
				c)	d)
7.	**Unit - IV**	**CO4**	**K1**		
				a)	b)
				c)	d)
8.	**Unit - IV**	**CO4**	**K2**		
				a)	b)
				c)	d)
9.	**Unit - V**	**CO5**	**K1**		
				a)	b)
				c)	d)
10.	**Unit - V**	**CO5**	**K2**		
				a)	b)
				c)	d)

Answer **ALL** the questions		**PART – B**		**(5 x 5 = 25 Marks)**
11. a)	**Unit - I**	**CO1**	**K2**	
		OR		
11. b)	**Unit - I**	**CO1**	**K2**	
12. a)	**Unit - II**	**CO2**	**K3**	
		OR		
12. b)	**Unit - II**	**CO2**	**K3**	
13. a)	**Unit - III**	**CO3**	**K2**	
		OR		
13. b)	**Unit - III**	**CO3**	**K2**	
14. a)	**Unit - IV**	**CO4**	**K3**	
		OR		
14. b)	**Unit - IV**	**CO4**	**K3**	
15. a)	**Unit - V**	**CO5**	**K3**	
		OR		
15. b)	**Unit - V**	**CO5**	**K3**	

Answer **ALL** the questions		**PART – C**		**(5 x 8 = 40 Marks)**
16. a)	**Unit - I**	**CO1**	**K3**	
		OR		
16. b)	**Unit - I**	**CO1**	**K3**	
17. a)	**Unit - II**	**CO2**	**K4**	
		OR		
17. b)	**Unit - II**	**CO2**	**K4**	
18. a)	**Unit - III**	**CO3**	**K3**	
		OR		
18. b)	**Unit - III**	**CO3**	**K3**	
19. a)	**Unit - IV**	**CO4**	**K4**	
		OR		
19. b)	**Unit - IV**	**CO4**	**K4**	
20. a)	**Unit - V**	**CO5**	**K4**	
		OR		
20. b)	**Unit - V**	**CO5**	**K4**	

Course Name	DIFFERENTIAL CALCULUS			
Course Code	23UMTCC12	**L**	**P**	**C**
Category	CORE	4	-	4

COURSE OBJECTIVES:

- The basic skills of differentiation, successive differentiation, and their applications.
- Basic knowledge on the notions of curvature, evolutes, involutes and polar co-ordinates and in solving related problems.

UNIT – I Successive Differentiation **12**

Introduction (Review of basic concepts) – The n^{th} derivative – Standard results – Fractional expressions – Trigonometrical transformation – Formation of equations involving derivatives – Leibnitz formula for the n^{th} derivative of a product – Feynman's method of differentiation

UNIT – II Partial Differentiation **12**

Partial derivatives – Successive partial derivatives – Function of a function rule – Total differential coefficient – A special case – Implicit Functions

UNIT - III Partial Differentiation (Continued) **12**

Homogeneous functions – Partial derivatives of a function of two variables – Maxima and Minima of functions of two variables - Lagrange's method of undetermined multipliers.

UNIT – IV Envelope **12**

Method of finding the envelope – Another definition of envelope – Envelope of family of curves which are quadratic in the parameter.

UNIT - V Curvature **12**

Definition of Curvature – Circle, Radius and Centre of Curvature – Evolutes and Involutes – Radius of Curvature in Polar Co-ordinates.

Total Lecture Hours **60**

BOOKS FOR STUDY:

- H. Anton, I. Birens and S. Davis, Calculus, John Wiley and Sons, Inc., 2002
- G.B. Thomas and R.L. Finney, Calculus, Pearson Education, 2010.
- M.J. Strauss, G.L. Bradley and K. J. Smith, Calculus, 3rd Ed., Dorling Kindersley (India) P. Ltd. (Pearson Education), Delhi, 2007.

BOOKS FOR REFERENCES:

- R. Courant and F. John, Introduction to Calculus and Analysis (Volumes I & II), Springer- Verlag, New York, Inc., 1989.
- T. Apostol, Calculus, Volumes I and II.
- S. Goldberg, Calculus and mathematical analysis.
- S. Narayanan and T.K. Manickavachagom Pillay, Calculus,Volume I - S. Viswanathan Publishers Pvt. Ltd. 2006

WEB RESOURCES:

- **https://nptel.ac.in**
- **https;//www.mathwarehous.com/**
- **https;//www.mathhelp.com/**
- **https;//www.mathsisfun.com/**

Nature of Course	EMPLOYABILITY	✓	SKILL ORIENTED		ENTREPRENEURSHIP			
Curriculum Relevance	LOCAL		REGIONAL		NATIONAL		GLOBAL	✓
Changes Made in the Course	Percentage of Change	**50**	No Changes Made		New Course			

*** Treat 20% as each unit (20*5=100%) and calculate the percentage of change for the course.**

COURSE OUTCOMES:		**K LEVEL**
After studying this course, the students will be able to:		
CO1	Find the nth derivative, form equations involving derivatives and apply Leibnitz formula	**K1 to K4**
CO2	Find the partial derivative and total derivative coefficient	**K1 to K4**
CO3	Determine maxima and minima of functions of two variables and to use the Lagrange's method of undetermined multipliers	**K1 to K4**
CO4	Find the envelope of a given family of curves	**K1 to K4**
CO5	Find the evolutes and involutes and to find the radius of curvature using polar co-ordinates	**K1 to K4**

MAPPING WITH PROGRAM OUTCOMES:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	1	3	-	-	-				
CO2	2	1	3	-	-	-				

CO3	3	2	3	2	-	-				
CO4	3	2	3	2	1	-				
CO5	3	2	3	2	1	-				

S- STRONG **M – MEDIUM** **L - LOW**

CO / PO MAPPING:

COS	PSO1	PSO2	PSO3	PSO4	PSO5
CO 1	3	2	1		
CO 2	3	2	1		
CO 3	3	2	1		
CO 4	3	2	1		
CO 5	3	2	1		
WEIGHTAGE	15	10	5		
WEIGHTED PERCENTAGE OF COURSE CONTRIBUTION TO POS	3	2	1		

LESSON PLAN:

UNIT	DIFFERENTIAL CALCULUS	HRS	PEDAGOGY
I	Introduction (Review of basic concepts) – The n^{th} derivative – Standard results – Fractional expressions – Trigonometrical transformation – Formation of equations involving derivatives – Leibnitz formula for the n^{th} derivative of a product – Feynman's method of differentiation	12	Chalk & Talk
II	Partial derivatives – Successive partial derivatives – Function of a function rule – Total differential coefficient – A special case – Implicit Functions.	12	Chalk & Talk
III	Homogeneous functions – Partial derivatives of a function of two variables – Maxima and Minima of functions of two variables - Lagrange's method of undetermined multipliers.	12	Chalk & Talk
IV	Method of finding the envelope – Another definition of envelope – Envelope of family of curves which are quadratic in the parameter.	12	Chalk & Talk
V	Definition of Curvature – Circle, Radius and Centre of Curvature – Evolutes and Involutes – Radius of Curvature in Polar Co-ordinates.	12	Chalk & Talk

Learning Outcome Based Education & Assessment (LOBE) Formative Examination - Blue Print Articulation Mapping – K Levels with Course Outcomes (COs)						
Internal	**Cos**	**K Level**	**Section A**		**Section B Either or Choice**	**Section C Either or Choice**
			MCQs			
			No. of. Questions	**K - Level**		
CI AI	**CO1**	**K1 – K4**	2	K1,K2	2(K2,K2)	2(K3,K3)
	CO2	**K1 – K4**	2	K1,K2	2(K3,K3)	2(K4,K4)
CI AII	**CO3**	**K1 – K4**	2	K1,K2	2(K2,K2)	2(K3,K3)
	CO4	**K1 – K4**	2	K1,K2	2(K3,K3)	2(K4,K4)
Question Pattern CIA I & II		**No. of Questions to be asked**	4		4	4
		No. of Questions to be answered	4		2	2
		Marks for each question	1		5	8
		Total Marks for each section	4		10	16

Distribution of Marks with K Level CIA I & CIA II							
	K Level	**Section A (Multiple Choice Questions)**	**Section B (Either / Or Choice)**	**Section C (Either / Or Choice)**	**Total Marks**	**% of (Marks without choice)**	**Consolidate of %**
CIA I	**K1**	**2**			**2**	**3.6**	**25**
	K2	**2**	**10**		**12**	**21.4**	
	K3		**10**	**16**	**26**	**46.4**	**46.4**
	K4			**16**	**16**	**28.6**	**28.6**
	Marks	**4**	**20**	**32**	**56**	**100**	**100**
CIA II	**K1**	**2**			**2**	**3.6**	**7.2**
	K2	**2**	**10**		**2**	**3.6**	
	K3		**10**	**16**	**26**	**46.4**	**46.4**
	K4			**16**	**26**	**46.4**	**46.4**
	Marks	**4**	**20**	**32**	**56**	**100**	**100**

K1- Remembering and recalling facts with specific answers

K2- Basic understanding of facts and stating main ideas with general answers

K3- Application oriented- Solving Problems

K4- Examining, analyzing, presentation and make inferences with evidences

CO5 will be allotted for individual Assignment which carries five marks as part of CIA component.

Summative Examination – Blue Print Articulation Mapping – K Level with Course Outcomes (COs)						
S. No	Cos	K - Level	Section A (MCQs)		Section B (Either / or Choice) With K - LEVEL	Section C (Either / or Choice) With K - LEVEL
			No. of Questions	K – Level		
1	CO1	K1 – K4	2	K1,K2	2(K2,K2)	2(K3,K3)
2	CO2	K1 – K4	2	K1,K2	2(K3,K3)	2(K4,K4)
3	CO3	K1 – K4	2	K1,K2	2(K2,K2)	2(K3,K3)
4	CO4	K1 – K4	2	K1,K2	2(K3,K3)	2(K4,K4)
5	CO5	K1 – K4	2	K1,K2	2(K3,K3)	2(K4,K4)
No. of Questions to be Asked			10		10	10
No. of Questions to be answered			10		5	5
Marks for each question			1		5	8
Total Marks for each section			10		25	40
(Figures in parenthesis denotes, questions should be asked with the given K level)						

Distribution of Marks with K Level						
K Level	Section A (Multiple Choice Questions)	Section B (Either or Choice	Section C (Either/ or Choice)	Total Marks	% of (Marks without choice)	Consolidated %
K1	5			5	3.6	4
K2	5	20		25	17.8	18
K3		30	32	62	44.3	44
K4			48	48	34.3	34
Marks	10	50	80	140	100	100
NB: Higher level of performance of the students is to be assessed by attempting higher level of K levels.						

Summative Examinations - Question Paper – Format

Q. No.	Unit	CO	K-level		
Answer **ALL** the questions				**PART – A**	**(10 x 1 = 10 Marks)**
1.	**Unit - I**	**CO1**	**K1**		
				a)	b)
				c)	d)
2.	**Unit - I**	**CO1**	**K2**		
				a)	b)
				c)	d)
3.	**Unit - II**	**CO2**	**K1**		
				a)	b)
				c)	d)
4.	**Unit - II**	**CO2**	**K2**		
				a)	b)
				c)	d)
5.	**Unit - III**	**CO3**	**K1**		
				a)	b)
				c)	d)
6.	**Unit - III**	**CO3**	**K2**		
				a)	b)
				c)	d)
7.	**Unit - IV**	**CO4**	**K1**		
				a)	b)
				c)	d)
8.	**Unit - IV**	**CO4**	**K2**		
				a)	b)
				c)	d)
9.	**Unit - V**	**CO5**	**K1**		
				a)	b)
				c)	d)
10.	**Unit - V**	**CO5**	**K2**		
				a)	b)
				c)	d)

Answer **ALL** the questions		**PART – B**		**(5 x 5 = 25 Marks)**
11. a)	**Unit - I**	**CO1**	**K2**	
		OR		
11. b)	**Unit - I**	**CO1**	**K2**	
12. a)	**Unit - II**	**CO2**	**K3**	
		OR		
12. b)	**Unit - II**	**CO2**	**K3**	
13. a)	**Unit - III**	**CO3**	**K2**	
		OR		
13. b)	**Unit - III**	**CO3**	**K2**	
14. a)	**Unit - IV**	**CO4**	**K3**	
		OR		
14. b)	**Unit - IV**	**CO4**	**K3**	
15. a)	**Unit - V**	**CO5**	**K3**	
		OR		
15. b)	**Unit - V**	**CO5**	**K3**	

Answer **ALL** the questions		**PART – C**		**(5 x 8 = 40 Marks)**
16. a)	**Unit - I**	**CO1**	**K3**	
		OR		
16. b)	**Unit - I**	**CO1**	**K3**	
17. a)	**Unit - II**	**CO2**	**K4**	
		OR		
17. b)	**Unit - II**	**CO2**	**K4**	
18. a)	**Unit - III**	**CO3**	**K3**	
		OR		
18. b)	**Unit - III**	**CO3**	**K3**	
19. a)	**Unit - IV**	**CO4**	**K4**	
		OR		
19. b)	**Unit - IV**	**CO4**	**K4**	
20. a)	**Unit - V**	**CO5**	**K4**	
		OR		
20. b)	**Unit - V**	**CO5**	**K4**	

Course Name	ALLIED PHYSICS – I			
Course Code	23UPHEA11	**L**	**P**	**C**
Category	ALLIED PAPER	3	-	3

COURSE OBJECTIVES:

- To impart basic principles of Physics that which would be helpful for students who have taken programmes other than Physics.

UNIT - I	**WAVES, OSCILLATIONS AND ULTRASONICS**	**09**

Simple harmonic motion (SHM) – composition of two SHMs at right angles (periods in the ratio 1:1) – Lissajous figures – uses – laws of transverse vibrations of strings – determination of AC frequency using sonometer (steel and brass wires) – ultrasound – production – piezoelectric method – applications of ultrasonics

UNIT - II	**PROPERTIES OF MATTER**	**09**

Elasticity: elastic constants – bending of beam – theory of non- uniform bending – determination of Young's modulus by non-uniform bending – energy stored in a stretched wire – torsion of a wire – determination of rigidity modulus by torsional pendulum

Viscosity: streamline and turbulent motion – critical velocity – coefficient of viscosity – Poiseuille's formula – comparison of viscosities – burette method,

Surface tension: definition – molecular theory – droplets formation.

UNIT - III	**HEAT AND THERMODYNAMICS**	**09**

Joule-Kelvin effect – Joule-Thomson porous plug experiment – theory – temperature of inversion – liquefaction of Oxygen– importance of cryocoolers – thermodynamic system – thermodynamic equilibrium – laws of thermodynamics – heat engine – Carnot's cycle – efficiency – entropy – change of entropy in reversible and irreversible process.

UNIT - IV	**ELECTRICITY AND MAGNETISM**	**09**

Potentiometer – principle – measurement of thermo emf using potentiometer –magnetic field due to a current carrying conductor – Biot-Savart's law – field along the axis of the coil carrying current – peak, average and RMS values of ac current and voltage – power factor and current values in an AC circuit

UNIT - V	**DIGITAL ELECTRONICS**	**09**

Logic gates, OR, AND, NOT, NAND, NOR , EXOR logic gates – universal building blocks – Boolean algebra – De Morgan's theorem – verification

Total Lecture Hours	**45**

BOOKS FOR STUDY:

- R.Murugesan (2001), Allied Physics, S. Chand & Co, New Delhi.
- Brijlal and N.Subramanyam (1994), Waves and Oscillations, Vikas Publishing House, New Delhi.
- Brijlal and N.Subramaniam (1994), Properties of Matter, S.Chand & Co., New Delhi.
- J.B.Rajam and C.L.Arora (1976). Heat and Thermodynamics (8th edition), S.Chand & Co., New Delhi.
- R.Murugesan (2005), Optics and Spectroscopy, S.Chand & Co ,New Delhi.
- A.Subramaniyam, Applied Electronics 2nd Edn., National Publishing Co., Chennai.

BOOKS FOR REFERENCES:

- Resnick Halliday and Walker (2018). Fundamentals of Physics (11th edition), John Willey and Sons, Asia Pvt .Ltd., Singapore.
- V.R.Khann aand R.S.Bedi (1998), Text book of Sound 1st Edn. Kedharnaath Publish & Co, Meerut.
- N.S.Khare and S.S.Srivastava (1983), Electricity and Magnetism 10th Edn., Atma Ram & Sons, New Delhi.
- D.R.Khanna and H.R. Gulati (1979). Optics, S. Chand Co. Ltd., New Delhi.
- V.K. Metha (2004).Principles of electronics 6th Edn. S.Chand and company.

WEB RESOURCES:

- **https://youtu.be/M_5KYncYNyc**
- **https://youtu.be/ljJLJgIvaHY**
- **https://youtu.be/7mGqd9HQ_AU**
- **https://youtu.be/h5jOAw57OXM**
- **https://learningtechnologyofficial.com/category/fluid-mechanics-lab/**

Nature of Course	EMPLOYABILITY	✓	SKILL ORIENTED		ENTREPRENEURSHIP			
Curriculum Relevance	LOCAL		REGIONAL		NATIONAL		GLOBAL	✓
Changes Made in the Course	Percentage of Change	**50**	No Changes Made		New Course			

*** Treat 20% as each unit (20*5=100%) and calculate the percentage of change for the course.**

COURSE OUTCOMES:		K LEVEL
After studying this course, the students will be able to:		
CO1	Explain types of motion and extend their knowledge in the study of various dynamic motions analyze and demonstrate mathematically. Relate theory with practical applications in medical field	**K1 to K4**
CO2	Explain their knowledge of understanding about materials and their behaviors and apply it to various situations in laboratory and real life.	**K1 to K4**
CO3	Comprehend basic concept of thermodynamics concept of entropy and associated theorems able to interpret the process of flow temperature physics in the background of growth of this technology.	**K1 to K4**
CO4	Articulate the knowledge about electric current resistance, capacitance in terms of potential electric field and electric field.	**K1 to K4**
CO5	Interpret the real life solutions using AND, OR, NOT basic logic gates and intend their ideas to universal building blocks.	**K1 to K4**

MAPPING WITH PROGRAM OUTCOMES:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	3	2	2	3	2	2	3	2	3
CO2	2	3	3	3	2	2	3	2	3	3
CO3	3	2	3	2	3	3	2	3	3	3
CO4	3	3	3	3	3	2	3	2	2	2
CO5	2	2	3	3	2	3	3	3	3	2

3 - STRONG **2 – MEDIUM** **1 - LOW**

CO / PO MAPPING:

COS	PSO1	PSO2	PSO3	PSO4	PSO5
CO 1	3	1	3	-	2
CO 2	3	1	3	-	2
CO 3	3	1	3	-	2
CO 4	3	1	3	-	2
CO 5	3	1	3	-	2
WEITAGE					
WEIGHTED PERCENTAGE OF COURSE CONTRIBUTION TO POS					

LESSON PLAN:

UNIT	ALLIED PHYSICS – I	HRS	PEDAGOGY
I	Simple harmonic motion (SHM) – composition of two SHMs at right angles (periods in the ratio 1:1) – Lissajous figures – uses – laws of	9	Lecture method, PPT,

	transverse vibrations of strings – determination of AC frequency using sonometer (steel and brass wires) – ultrasound – production – piezoelectric method – applications of ultrasonics		**Demonstration**
II	*Elasticity*: elastic constants – bending of beam – theory of non- uniform bending – determination of Young's modulus by non-uniform bending – energy stored in a stretched wire – torsion of a wire – determination of rigidity modulus by torsional pendulum *Viscosity*: streamline and turbulent motion – critical velocity – coefficient of viscosity – Poiseuille's formula – comparison of viscosities – burette method, *Surface tension*: definition – molecular theory – droplets formation.	**9**	**Lecture method, PPT, Demonstration**
III	Joule-Kelvin effect – Joule-Thomson porous plug experiment – theory – temperature of inversion – liquefaction of Oxygen– importance of cryocoolers – thermodynamic system – thermodynamic equilibrium – laws of thermodynamics – heat engine – Carnot's cycle – efficiency – entropy – change of entropy in reversible and irreversible process.	**9**	**Lecture method, PPT, Demonstration**
IV	Potentiometer – principle – measurement of thermo emf using potentiometer –magnetic field due to a current carrying conductor – Biot-Savart's law – field along the axis of the coil carrying current – peak, average and RMS values of ac current and voltage – power factor and current values in an AC circuit	**9**	**Lecture method, PPT, Demonstration**
V	Logic gates, OR, AND, NOT, NAND, NOR , EXOR logic gates – universal building blocks – Boolean algebra – De Morgan's theorem – verification	**9**	**Lecture method, PPT, Demonstration**

Learning Outcome Based Education & Assessment (LOBE)
Formative Examination - Blue Print
Articulation Mapping – K Levels with Course Outcomes (COs)

Internal	**Cos**	**K Level**	**Section A**		**Section B Either or Choice**	**Section C Either or Choice**
			MCQs			
			No. of. Questions	**K - Level**		
CIA I	**CO1**	**K1 – K4**	2	K1, K2	K1 OR K1	K3 OR K3
	CO2	**K1 – K4**	2	K1,K2	K2 OR K2	K4 OR K4
CIA II	**CO3**	**K1 – K4**	2	K1, K2	K2 OR K2	K3 OR K3
	CO4	**K1 – K4**	2	K1,K2	K3 OR K3	K4 OR K4
Question Pattern CIA I & II		**No. of Questions to be asked**	4		4	4
		No. of Questions to be answered	4		2	2
		Marks for each question	1		5	8
		Total Marks for each section	4		10	16

Distribution of Marks with K Level CIA I & CIA II							
	K Level	Section A (Multiple Choice Questions)	Section B (Either / Or Choice)	Section C (Either / Or Choice)	Total Marks	% of (Marks without choice)	Consolidate of %
CIA I	K1	2	10	-	12	21.43	-
	K2	2	10	-	12	21.43	
	K3	-	-	16	16	28.57	42.86
	K4	-	-	16	16	28.57	71.43
	Marks	4	20	32	56	100	100
CIA II	K1	2			2	3.57	-
	K2	2	10		12	21.43	
	K3		10	16	26	46.43	25.00
	K4			16	16	28.57	71.43
	Marks	4	20	32	56	100	100

K1- Remembering and recalling facts with specific answers

K2- Basic understanding of facts and stating main ideas with general answers

K3- Application oriented- Solving Problems

K4-Examining, analyzing, presentation and make inferences with evidences

CO5 will be allotted for individual Assignment which carries five marks as part of CIA component.

Summative Examination – Blue Print Articulation Mapping – K Level with Course Outcomes (COs)						
S. No	COs	K - Level	Section A (MCQs)		Section B (Either / or Choice) With K - LEVEL	Section C (Either / or Choice) With K - LEVEL
			No. of Questions	K – Level		
1	CO1	K1, K2	2	K1, K2	K1, K1	K2, K2
2	CO2	K1, K2	2	K1, K2	K2, K2	K2, K2
3	CO3	K1, K2	2	K1, K2	K2, K2	K3, K3
4	CO4	K1, K2	2	K1, K2	K3, K3	K3, K3
5	CO5	K1, K2	2	K1, K2	K4, K4	K4, K4
No. of Questions to be Asked			10		10	10
No. of Questions to be answered			10		5	5
Marks for each question			1		5	8
Total Marks for each section			10		25	40
(Figures in parenthesis denotes, questions should be asked with the given K level)						

Distribution of Marks with K Level						
K Level	**Section A (Multiple Choice Questions)**	**Section B (Either or Choice**	**Section C (Either/ or Choice)**	**Total Marks**	**% of (Marks without choice)**	**Consolidated %**
K1	**5**	**10**		**15**	**10.72**	**-**
K2	**5**	**20**	**32**	**57**	**40.71**	**51.43**
K3		**10**	**32**	**42**	**30.00**	**30.00**
K4		**10**	**16**	**26**	**18.57**	**18.57**
Marks	**10**	**50**	**80**	**140**	**100**	**100**
NB: Higher level of performance of the students is to be assessed by attempting higher level of K levels.						

Summative Examinations - Question Paper – Format

Q. No.	**Unit**	**CO**	**K-level**		
Answer **ALL** the questions				**PART – A**	**(10 x 1 = 10 Marks)**
1.	**Unit - I**	**CO1**	**K1**		
				a)	b)
				c)	d)
2.	**Unit - I**	**CO1**	**K2**		
				a)	b)
				c)	d)
3.	**Unit - II**	**CO2**	**K1**		
				a)	b)
				c)	d)
4.	**Unit - II**	**CO2**	**K2**		
				a)	b)
				c)	d)
5.	**Unit - III**	**CO3**	**K1**		
				a)	b)
				c)	d)
6.	**Unit - III**	**CO3**	**K2**		
				a)	b)
				c)	d)
7.	**Unit - IV**	**CO4**	**K1**		
				a)	b)
				c)	d)
8.	**Unit - IV**	**CO4**	**K2**		
				a)	b)
				c)	d)
9.	**Unit - V**	**CO5**	**K1**		
				a)	b)
				c)	d)
10.	**Unit - V**	**CO5**	**K2**		
				a)	b)
				c)	d)

Answer **ALL** the questions		**PART – B**		**(5 x 5 = 25 Marks)**
11. a)	**Unit - I**	**CO1**	**K1**	
		OR		
11. b)	**Unit - I**	**CO1**	**K1**	
12. a)	**Unit - II**	**CO2**	**K2**	
		OR		
12. b)	**Unit - II**	**CO2**	**K2**	
13. a)	**Unit - III**	**CO3**	**K2**	
		OR		
13. b)	**Unit - III**	**CO3**	**K2**	
14. a)	**Unit - IV**	**CO4**	**K3**	
		OR		
14. b)	**Unit - IV**	**CO4**	**K3**	
15. a)	**Unit - V**	**CO5**	**K4**	
		OR		
15. b)	**Unit - V**	**CO5**	**K4**	

Answer **ALL** the questions		**PART – C**		**(5 x 8 = 40 Marks)**
16. a)	**Unit - I**	**CO1**	**K2**	
		OR		
16. b)	**Unit - I**	**CO1**	**K2**	
17. a)	**Unit - II**	**CO2**	**K2**	
		OR		
17. b)	**Unit - II**	**CO2**	**K2**	
18. a)	**Unit - III**	**CO3**	**K3**	
		OR		
18. b)	**Unit - III**	**CO3**	**K3**	
19. a)	**Unit - IV**	**CO4**	**K3**	
		OR		
19. b)	**Unit - IV**	**CO4**	**K3**	
20. a)	**Unit - V**	**CO5**	**K4**	
		OR		
20. b)	**Unit - V**	**CO5**	**K4**	

Course Name	ALLIED PHYSICS PRACTICALS – I			
Course Code	23UPHEP11	**L**	**P**	**C**
Category	ALLIED PRACTICAL	**-**	**2**	**1**

COURSE OBJECTIVES:

- Apply various physics concepts to understand Properties of Matter and waves, set up experimentation to verify theories, quantify and analyse, able to do error analysis and correlate results

SEMESTER - I LIST OF EXPERIMENTS **30**

Minimum of Eight Experiments from the list:

1. Young's modulus by non-uniform bending using pin and microscope
2. Young's modulus by non-uniform bending using optic lever, scale and telescope
3. Rigidity modulus by static torsion method.
4. Rigidity modulus by torsional oscillations without mass
5. Surface tension and interfacial Surface tension – drop weight method
6. Comparison of viscosities of two liquids – burette method
7. Specific heat capacity of a liquid – half time correction
8. Verification of laws of transverse vibrations using sonometer
9. Calibration of low range voltmeter using potentiometer
10. Determination of thermo emf using potentiometer
11. Verification of truth tables of basic logic gates using ICs
12. Verification of De Morgan's theorems using logic gate ICs.
13. Use of NAND as universal building block.

Note : Use of digital balance permitted

Total Lecture Hours	**30**

BOOKS FOR STUDY:

- Srinivasan.M.N., Balasubramanian.S., Ranganathan.R., A Text Book of Practical Physics, 2017 Edition, Sultan Chand & Sons

BOOKS FOR REFERENCES:

- Ouseph.C., Practical Physics and Electronics, 2013, S.Viswanathan.P.Ltd.
- Practical Physics and Electronics, C.C.Ouseph, U.J.Rao, V.Vijayendran, S.Viswanathan Publishers (2007)

WEB RESOURCES:

- **https://nptel.ac.in/course.html/physics/experimental physics I, II and III**
- **https://nptel.ac.in/courses/115/105/115105110/**
- **https://www.youtube.com/playlist?list=PLuiPz6iU5SQ8-rZn_LgLofRX7n8z4tHYK**

Nature of Course	EMPLOYABILITY		SKILL ORIENTED	✓	ENTREPRENEURSHIP			
Curriculum Relevance	LOCAL		REGIONAL		NATIONAL		GLOBAL	✓
Changes Made in the Course	Percentage of Change	**70**	No Changes Made		New Course			
*** Treat 20% as each unit (20*5=100%) and calculate the percentage of change for the course.**								

COURSE OUTCOMES:		**K LEVEL**
After studying this course, the students will be able to:		
CO1	Remembering the Aim and apparatus used in the experiment	**K1**
CO2	Understanding of laws and formulas of the experiment	**K2**
CO3	Applying the knowledge to do the experiment	**K4**
CO4	Calculating and examining the aim of the experiment	**K3**
CO5	Interpreting the result of the experiment	**K2**

MAPPING WITH PROGRAM OUTCOMES

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	3	1	1	2	3	3	3	1	3
CO2	3	3	2	2	2	3	3	3	1	3
CO3	3	3	3	3	3	3	3	3	2	3
CO4	3	3	2	3	3	3	3	3	1	3
CO5	3	3	2	2	2	3	3	3	1	3

3 - STRONG **2 – MEDIUM** **1 - LOW**

CO / PO MAPPING:

COS	PSO1	PSO2	PSO3	PSO4	PSO5
CO 1	3	2	3	-	2
CO 2	3	2	3	-	2
CO 3	3	2	3	-	2
CO 4	3	2	3	-	2
CO 5	3	2	3	-	2
WEITAGE					
WEIGHTED PERCENTAGE OF COURSE CONTRIBUTION TO POS					

LESSON PLAN:

SEM	ALLIED PHYSICS PRACTICALS – I	HRS	PEDAGOGY
I	1. Young's modulus by non-uniform bending using pin and microscope 2. Young's modulus by non-uniform bending using optic lever, scale and telescope 3. Rigidity modulus by torsional oscillations without mass 4. Comparison of viscosities of two liquids – burette method 5. Verification of laws of transverse vibrations using sonometer 6. Calibration of low range voltmeter using potentiometer 7. Verification of truth tables of basic logic gates using ICs 8. Use of NAND as universal building block.	30	**Demonstration and Video**

Learning Outcome Based Education & Assessment (LOBE) Formative Examination - Blue Print Articulation Mapping – K Levels with Course Outcomes (COs)				
Internal	**Cos**	**K Level**	**No. of. Questions**	**K - Level**
CIA-I	**CO1 - CO5**	**K1 – K4**	**1** Question for Each Student	**K1 – K4**
Question Pattern CIA - I		**No. of Questions to be asked**	**1** Question for Each Student	
		No. of Questions to be answered	**1**	
		Marks for each question	**30**	
		Total Marks for each section	**30**	

Distribution of Marks with COs & K Level for Correction of CIA I				
	COs	**Distribution of the work of the experiment**	**K - Level**	**MARKS**
CIA I	**CO1**	Aim and apparatus	**K1**	**2.0**
	CO2	Formula and Tabular Column	**K2**	**5**
	CO3	Understanding and Observation	**K4**	**12.0**
	CO4	Calculation and Graph	**K3**	**8.0**
	CO5	Interpretation of result	**K2**	**3.0**
	Total Marks			**30**

Distribution of Marks with K Level CIA I					
	K Level	**Distribution of the work of the experiment**	**Total Marks**	**% of (Marks without choice)**	**Consolidate of %**
CIA I	**K1**	Aim and apparatus	2	6.66	-
	K2	Formula and Tabular Column Interpretation of result	8	26.67	
	K3	Understanding and Observation	8	26.67	**33.33**
	K4	Calculation and Graph	12	40.00	**60.00**
	Marks		**30**	**100**	**100**

K1- Remembering and recalling facts with specific answers

K2- Basic understanding of facts and stating main ideas with general answers

K3- Application oriented- Solving Problems

K4- Examining, analyzing, presentation and make inferences with evidences

CO5 will be allotted for individual Assignment which carries five marks as part of CIA component.

Summative Examination – Blue Print Articulation Mapping – K Level with Course Outcomes (COs)			
COs	**K - Level**	**No. of Questions**	**K – Level**
CO1 - CO5	**K1 – K4**	**1** Question for Each Student	**K1 – K4**
No. of Questions to be Asked		**1** Question for Each Student	
No. of Questions to be answered		**1**	
Marks for each question		**60**	
Total Marks for each section		**60**	
(Figures in parenthesis denotes, questions should be asked with the given K level)			

Distribution of Marks with COs & K Level for Correction of the Summative Exam			
COs	**Distribution of the work of the experiment**	**K - Level**	**MARKS**
CO1	Aim and apparatus	**K1**	**5**
CO2	Formula and Tabular Column	**K2**	**10**
CO3	Understanding and Observation	**K4**	**25**
CO4	Calculation and Graph	**K3**	**15**
CO5	Interpretation of result	**K2**	**5**
Total Marks			**60**

Distribution of Marks with K Level				
K Level	**Parameters for K-Level**	**Total Marks**	**% of (Marks without choice)**	**Consolidated %**
K1	Aim and apparatus	**5**	**8.33**	**-**
K2	Formula and Tabular Column, Interpretation of result	**15**	**25.00**	**8.33**
K3	Understanding and Observation	**25**	**41.67**	**33.33**
K4	Calculation and Graph	**15**	**25.00**	**75.00**
Marks		**60**	**100**	**100**
NB: Higher level of performance of the students is to be assessed by attempting higher level of K levels.				

Course Name	MATHEMATICS FOR COMPETITIVE EXAMINATION - I			
Course Code	23UMTNMI1	**L**	**P**	**C**
Category	NON MAJOR ELECTIVE	2	-	2

COURSE OBJECTIVES:

- To improve the ability to face the competitive examinations.
- To solve numbers, percentage, ratio.
- To identify the exact method to problems.
- To apply the concepts in Competitive Examinations.

UNIT – I **6**

Number system – Decimals - Fractions.

UNIT – II **6**

Operation on numbers – Divisibility – Arithmetic Progression – Geometric Progression.

UNIT - III **6**

HCF Factorization method – Division method –Factorization method of finding LCM – Common Division method – Comparison of fractions.

UNIT – IV **6**

Concept of percentage- Results on population – Results on Depreciation.

UNIT - V **6**

Comparison of ratios - Compounded ratio - Variation.

Total Lecture Hours **30**

BOOKS FOR STUDY:

- Text Material will be supplied by the Department.

BOOKS FOR REFERENCES:

- Aggarwal. R.S, **Quantitative Aptitude for Competitive Examinations,** S.Chand and Company Ltd, Reprint 2011, New Delhi.
- Abhigit Guha, **Quantitative Aptitude,** fourth edition, Tata MC Graw Hill Publication, 2011, New Delhi.
- Mohan Rao. U, **Quantitative Aptitude,** Scitech Publications, Reprint, 2013, Chennai.

WEB RESOURCES:

- **https;//www.mathwarehous.com/**
- **https;//www.mathhelp.com/**
- **https;//www.mathsisfun.com/**

Nature of Course	EMPLOYABILITY	✓	SKILL ORIENTED		ENTREPRENEURSHIP			
Curriculum Relevance	LOCAL		REGIONAL	✓	NATIONAL		GLOBAL	
Changes Made in the Course	Percentage of Change		No Changes Made	✓	New Course			
*** Treat 20% as each unit (20*5=100%) and calculate the percentage of change for the course.**								

COURSE OUTCOMES:		**K LEVEL**
After studying this course, the students will be able to:		
CO1	Recall the concepts of numbers and decimals	**K1 to K2**
CO2	Demonstrate the understanding of divisibility and their properties	**K1 to K2**
CO3	Classify the factors in finding LCM and HCF	**K1 to K2**
CO4	Explain the percentage related problems	**K1 to K2**
CO5	Illustrate the problems on ratios	**K1 to K2**

MAPPING WITH PROGRAM OUTCOMES:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	2	2	3	3	3	3				
CO2	2	3	2	3	2	3				
CO3	3	2	3	2	3	3				
CO4	3	2	3	2	2	3				
CO5	2	3	3	3	2	2				

S- STRONG **M – MEDIUM** **L - LOW**

CO / PO MAPPING:

COS	PSO1	PSO2	PSO3	PSO4	PSO5
CO 1	3	2	1		
CO 2	3	2	1		
CO 3	3	2	1		
CO 4	3	2	1		
CO 5	3	2	1		
WEIGHTAGE	15	10	5		
WEIGHTED PERCENTAGE OF COURSE CONTRIBUTION TO POS	3	2	1		

LESSON PLAN:			
UNIT	**MATHEMATICS FOR COMPETITIVE EXAMINATION - I**	**HRS**	**PEDAGOGY**
I	Number system – Decimals - Fractions.	**6**	**Chalk & Talk**
II	Operation on numbers – Divisibility – Arithmetic Progression – Geometric Progression.	**6**	**Chalk & Talk**
III	HCF Factorization method – Division method –Factorization method of finding LCM – Common Division method – Comparison of fractions.	**6**	**Chalk & Talk**
IV	Concept of percentage- Results on population – Results on Depreciation	**6**	**Chalk & Talk**
V	Comparison of ratios - Compounded ratio - Variation.	**6**	**Chalk & Talk**

Learning Outcome Based Education & Assessment (LOBE) Formative Examination - Blue Print Articulation Mapping – K Levels with Course Outcomes (COs)				
Internal	**Cos**	**K Level**	**Section A**	
			MCQs	
			No. of. Questions	**K - Level**
CI AI	**CO1**	**K1 – K2**	**25**	**K1,K2**
	CO2	**K1 – K2**	**25**	**K1,K2**
CI AII	**CO3**	**K1 – K2**	**25**	**K1,K2**
	CO4	**K1 – K2**	**25**	**K1,K2**
Question Pattern CIA I & II		**No. of Questions to be asked**	**50**	
		No. of Questions to be answered	**50**	
		Marks for each question	**1**	
		Total Marks for each section	**50**	

* Two Formative examinations will be conducted as a part of Continuous Internal Assessment under which, 50 MCQ's will be asked [50X1=50 marks] from any 4 CO's. (Ist Test-2 CO's & IInd Test-2 CO's) in equal weightage

Distribution of Marks with K Level CIA I & CIA II					
	K Level	Section A (Multiple Choice Questions)	Total Marks	% of (Marks without choice)	Consolidate of %
CIA I	K1	30	30	60	100
	K2	20	20	40	
	K3				
	K4				
	Marks	50	50	100	100
CIA II	K1	30	30	60	100
	K2	20	20	40	
	K3				
	K4				
	Marks	50	50	100	100

K1- Remembering and recalling facts with specific answers

K2- Basic understanding of facts and stating main ideas with general answers

K3- Application oriented- Solving Problems

K4- Examining, analyzing, presentation and make inferences with evidences

CO5 will be allotted for individual Assignment which carries five marks as part of CIA component.

Summative Examination – Blue Print Articulation Mapping – K Level with Course Outcomes (COs)				
S. No	COs	K - Level	Section A (MCQs)	
			No. of Questions	K – Level
1	CO1	K1-K2	15	K1,K2
2	CO2	K1-K2	15	K1,K2
3	CO3	K1-K2	15	K1,K2
4	CO4	K1-K2	15	K1,K2
5	CO5	K1-K2	15	K1,K2
No. of Questions to be Asked			75	
No. of Questions to be answered			75	
Marks for each question			1	
Total Marks for each section			75	
(Figures in parenthesis denotes, questions should be asked with the given K level)				

In summative examinations, 75 MCQ's will be asked [75X1=75 marks] from all 5 CO's in equal weightage.

Distribution of Marks with K Level				
K Level	**Section A (Multiple Choice Questions)**	**Total Marks**	**% of (Marks without choice)**	**Consolidated %**
K1	**40**	**40**	**53**	**100**
K2	**35**	**35**	**47**	
K3				
K4				
Marks		**75**	**100**	**100**
NB: Higher level of performance of the students is to be assessed by attempting higher level of K levels.				

Course Name	FUNDAMENTALS OF MATHEMATICS			
Course Code	23UMTFC11	**L**	**P**	**C**
Category	CORE	2	-	2

COURSE OBJECTIVES:

- To bridge the gap and facilitate transition from higher secondary to tertiary education
- To instill confidence among stakeholders and inculcate interest for Mathematics

UNIT - I Algebra **6**

Binomial theorem, General term, middle term, problems based on these concepts

UNIT - II Algebra **6**

Sequences and series (Progressions). Fundamental principle of counting. Factorial n.

UNIT - III Algebra **6**

Permutations and combinations, Derivation of formulae and their connections, simple applications, combinations with repetitions, arrangements within groups, formation of groups.

UNIT - IV Trigonometry **6**

Introduction to trigonometric ratios, proof of sin(A+B), cos(A+B), tan(A+B) formulae, multiple and sub multiple angles, sin(2A), cos(2A), tan(2A) etc., transformations sum into product and product into sum formulae, inverse trigonometric functions, sine rule and cosine rule

UNIT - V Calculus **6**

Limits, standard formulae and problems, differentiation, first principle, uv rule, u/v rule, methods of differentiation, application of derivatives, integration - product rule and substitution method.

Total Lecture Hours **30**

BOOKS FOR STUDY:

- NCERT class XI and XII text books.
- Any State Board Mathematics text books of class XI and XII

BOOKS FOR REFERENCES:

- State Board Mathematics text books of class X
- State Board Mathematics text books of class IX
- NCERT class IX and X text books.

WEB RESOURCES:

- **https;//www.mathwarehous.com/**
- **https;//www.mathhelp.com/**
- **https;//www.mathsisfun.com/**

Nature of Course	EMPLOYABILITY		SKILL ORIENTED	✓	ENTREPRENEURSHIP			
Curriculum Relevance	LOCAL		REGIONAL	✓	NATIONAL		GLOBAL	
Changes Made in the Course	Percentage of Change		No Changes Made		New Course	✓		

*** Treat 20% as each unit (20*5=100%) and calculate the percentage of change for the course.**

COURSE OUTCOMES:		**K LEVEL**
After studying this course, the students will be able to:		
CO1	Prove the binomial theorem and apply it to find the expansions of any $(x + y)^n$ and also, solve the related problems	**K1 to K2**
CO2	Find the various sequences and series and solve the problems related to them. Explain the principle of counting.	**K1 to K2**
CO3	Find the number of permutations and combinations in different cases. Apply the principle of counting to solve the problems on permutations and combinations	**K1 to K**
CO4	Explain various trigonometric ratios and find them for different angles, including sum of the angles, multiple and submultiple angles, etc. Also, they can solve the problems using the transformations.	**K1 to K2**
CO5	Find the limit and derivative of a function at a point, the definite and indefinite integral of a function. Find the points of min/max of a function.	**K1 to K2**

MAPPING WITH PROGRAM OUTCOMES:

CO/PO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	**1**	**1**	**1**	**1**	**1**	**1**				
CO2	**2**	**1**	**1**	**2**	**2**	**1**				
CO3	**2**	**1**	**1**	**2**	**2**	**1**				
CO4	**1**	**1**	**1**	**1**	**1**	**1**				
CO5	**1**	**1**	**1**	**1**	**1**	**1**				

S- STRONG **M – MEDIUM** **L - LOW**

CO / PO MAPPING:

COS	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO 1	**3**	**2**	**1**		
CO 2	**3**	**2**	**1**		
CO 3	**3**	**2**	**1**		
CO 4	**3**	**2**	**1**		
CO 5	**3**	**2**	**1**		
WEIGHTAGE	**15**	**10**	**5**		
WEIGHTED PERCENTAGE	**3**	**2**	**1**		

OF COURSE CONTRIBUTION TO POS					

UNIT	FUNDAMENTALS OF MATHEMATICS	HRS	PEDAGOGY
I	Binomial theorem, General term, middle term, problems based on these concepts	6	Chalk & Talk
II	Sequences and series (Progressions). Fundamental principle of counting. Factorial n.	6	Chalk & Talk
III	Permutations and combinations, Derivation of formulae and their connections, simple applications, combinations with repetitions, arrangements within groups, formation of groups.	6	Chalk & Talk
IV	Introduction to trigonometric ratios, proof of sin(A+B), cos(A+B), tan(A+B) formulae, multiple and sub multiple angles, sin(2A), cos(2A), tan(2A) etc., transformations sum into product and product into sum formulae, inverse trigonometric functions, sine rule and cosine rule	6	Chalk & Talk
V	Limits, standard formulae and problems, differentiation, first principle, uv rule, u/v rule, methods of differentiation, application of derivatives, integration - product rule and substitution method.	6	Chalk & Talk

Learning Outcome Based Education & Assessment (LOBE)
Formative Examination - Blue Print
Articulation Mapping – K Levels with Course Outcomes (COs)

Internal	Cos	K Level	Section A	
			MCQs	
			No. of. Questions	K - Level
CI AI	CO1	K1 – K2	25	K1,K2
	CO2	K1 – K2	25	K1,K2
CI AII	CO3	K1 – K2	25	K1,K2
	CO4	K1 – K2	25	K1,K2
Question Pattern CIA I & II		No. of Questions to be asked	50	
		No. of Questions to be answered	50	
		Marks for each question	1	
		Total Marks for each section	50	

* Two Formative examinations will be conducted as a part of Continuous Internal Assessment under which, 50 MCQ's will be asked [50X1=50 marks] from any 4 CO's. (Ist Test-2 CO's & IInd Test-2 CO's) in equal weightage

Distribution of Marks with K Level CIA I & CIA II					
	K Level	**Section A (Multiple Choice Questions)**	**Total Marks**	**% of (Marks without choice)**	**Consolidate of %**
CIA I	**K1**	**30**	**30**	**60**	**100**
	K2	**20**	**20**	**40**	
	K3				
	K4				
	Marks	**50**	**50**	**100**	**100**
CIA II	**K1**	**30**	**30**	**60**	**100**
	K2	**20**	**20**	**40**	
	K3				
	K4				
	Marks	**50**	**50**	**100**	**100**

K1- Remembering and recalling facts with specific answers

K2- Basic understanding of facts and stating main ideas with general answers

K3- Application oriented- Solving Problems

K4- Examining, analyzing, presentation and make inferences with evidences

CO5 will be allotted for individual Assignment which carries five marks as part of CIA component.

Summative Examination – Blue Print Articulation Mapping – K Level with Course Outcomes (COs)				
S. No	COs	K - Level	Section A (MCQs)	
			No. of Questions	K – Level
1	CO1	K1-K2	15	K1,K2
2	CO2	K1-K2	15	K1,K2
3	CO3	K1-K2	15	K1,K2
4	CO4	K1-K2	15	K1,K2
5	CO5	K1-K2	15	K1,K2
No. of Questions to be Asked			75	
No. of Questions to be answered			75	
Marks for each question			1	
Total Marks for each section			75	
(Figures in parenthesis denotes, questions should be asked with the given K level)				

In summative examinations, 75 MCQ's will be asked [75X1=75 marks] from all 5 CO's in equal weightage.

Distribution of Marks with K Level				
K Level	Section A (Multiple Choice Questions)	Total Marks	% of (Marks without choice)	Consolidated %
K1	40	40	53	100
K2	35	35	47	
K3				
K4				
Marks		75	100	100
NB: Higher level of performance of the students is to be assessed by attempting higher level of K levels.				


SECOND SEMESTER

Course Name	ANALYTICAL GEOMETRY (TWO & THREE DIMENSIONS)			
Course Code	23UMTCC21	**L**	**P**	**C**
Category	CORE	5	-	5

COURSE OBJECTIVES:

- Necessary skills to analyze characteristics and properties of two- and three-dimensional geometric shapes.
- To present mathematical arguments about geometric relationships.
- To solve real world problems on geometry and its applications.

UNIT – I **15**

Pole, Polar - conjugate points and conjugate lines – diameters – conjugate diameters of an ellipse - semi diameters- conjugate diameters of hyperbola.

UNIT – II **15**

Polar coordinates: General polar equation of straight line – Polar equation of a circle given a diameter, Equation of a straight line, circle, conic – Equation of chord, tangent, normal. Equations of the asymptotes of a hyperbola

UNIT - III **15**

The Plane-Angle between two planes -Length of the perpendicular–Bisecting planes- Distance between two planes.

UNIT – IV **15**

The Straight line–angle between a line and a plane – co – planar lines–shortest distance between two skew lines –length of the perpendicular.

UNIT - V **15**

Equation of a sphere-general equation-section of a sphere by a plane-equation of the circle- tangent plane-angle of intersection of two spheres- condition for the orthogonality.

Total Lecture Hours **75**

BOOKS FOR STUDY:

- **Analytical Geometry(Two Dimensional** by P.Durai Pandian, Laxmi Duraipandian, D.Muhilan.
- **Analytical Geometry(Three Dimensions) and Vector Calculus** by Dr.S.Arumugam and Issac.

Unit I – Text Book 1: Chapter 6: Sections 6.9,6.10,6.13
Chapter 7: Sections 7.3,7.4
Unit II- Text book 1: Chapter 9: Sections 9.1& 9.3 to 9.8
Unit III – Text book 2- Chapter 2 (full)
Unit IV – Textbook 2: Chapter 3: Sections 3.1 & 3.2
Unit V – Text book 2: Chapter 4 (full)

BOOKS FOR REFERENCES:

- S. L. Loney, Co-ordinate Geometry.
- Robert J. T. Bell, Co-ordinate Geometry of Three Dimensions.
- William F. Osgood and William C. Graustein, Plane and Solid Analytic Geometry, Macmillan Company, New York, 2016.Calculus and Analytical Geometry, G.B. Thomas and R. L. Finny, Pearson Publication, 9th Edition, 2010.
- Robert C. Yates, Analytic Geometry with Calculus, Prentice Hall, Inc., New York, 1961.
- Earl W. Swokowski and Jeffery A. Cole, Algebra and Trigonometry with Analytic Geometry, Twelfth Edition, Brooks/Cole, Cengage Learning, CA, USA, 2010.
- William H. McCrea, Analytical Geometry of Three Dimensions, Dover Publications, Inc, New York, 2006.
- John F. Randelph, Calculus and Analytic Geometry, Wadsworth Publishing Company, CA, USA, 1969.
- Ralph Palmer Agnew, Analytic Geometry and Calculus with Vectors, McGraw-Hill Book Company, Inc. New York, 1962

WEB RESOURCES:

- **https://nptel.ac.in**
- **https://www.mathwarehous.com/**
- **https://www.mathhelp.com/**
- **https://www.mathsisfun.com/**

Nature of Course	EMPLOYABILITY	✓	SKILL ORIENTED		ENTREPRENEURSHIP			
Curriculum Relevance	LOCAL		REGIONAL		NATIONAL	✓	GLOBAL	
Changes Made in the Course	Percentage of Change	**40**	No Changes Made		New Course			

*** Treat 20% as each unit (20*5=100%) and calculate the percentage of change for the course.**

COURSE OUTCOMES:		**K LEVEL**
After studying this course, the students will be able to:		
CO1	Find pole, polar for conics, diameters, conjugate diameters for ellipse and hyperbola	**K1 to K4**
CO2	Find the polar equations of straight line and circle, equations of chord, tangent and normal and to find the asymptotes of hyperbola	**K1 to K4**
CO3	Explain in detail the system of Planes	**K1 to K4**
CO4	Explain in detail the system of Straight lines	**K1 to K4**
CO5	Explain in detail the system of Spheres	**K1 to K4**

MAPPING WITH PROGRAM OUTCOMES:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	2	2	2	1	-	-				
CO2	2	2	2	1	-	-				
CO3	3	2	2	1	-	-				
CO4	3	2	3	1	-	-				
CO5	3	2	3	1	-	-				

S- STRONG **M – MEDIUM** **L - LOW**

CO / PO MAPPING:

COS	PSO1	PSO2	PSO3	PSO4	PSO5
CO 1	3	2	1		
CO 2	3	2	1		
CO 3	3	2	1		
CO 4	3	2	1		
CO 5	3	2	1		
WEIGHTAGE	15	10	5		
WEIGHTED PERCENTAGE OF COURSE CONTRIBUTION TO POS	3	2	1		

LESSON PLAN:

UNIT	ANALYTICAL GEOMETRY (Two & Three Dimensions)	HRS	PEDAGOGY
I	Pole, Polar - conjugate points and conjugate lines – diameters – conjugate diameters of an ellipse - semi diameters- conjugate diameters of hyperbola.	15	Chalk & Talk
II	Polar coordinates: General polar equation of straight line – Polar equation of a circle given a diameter, Equation of a straight line, circle, conic – Equation of chord, tangent, normal. Equations of the asymptotes of a hyperbola.	15	Chalk & Talk
III	The Plane-Angle between two planes -Length of the perpendicular– Bisecting planes- Distance between two planes.	15	Chalk & Talk
IV	The Straight line–angle between a line and a plane – co – planar lines– shortest distance between two skew lines –length of the perpendicular.	15	Chalk & Talk
V	Equation of a sphere-general equation-section of a sphere by a plane-equation of the circle- tangent plane- angle of intersection of two spheres- condition for the orthogonality.	15	Chalk & Talk

Learning Outcome Based Education & Assessment (LOBE)
Formative Examination - Blue Print
Articulation Mapping – K Levels with Course Outcomes (COs)

Internal	Cos	K Level	Section A		Section B Either or Choice	Section C Either or Choice
			MCQs			
			No. of. Questions	K - Level		
CI AI	CO1	K1 – K4	2	K1,K2	2(K2,K2)	2(K3,K3)
	CO2	K1 – K4	2	K1,K2	2(K3,K3)	2(K4,K4)
CI AII	CO3	K1 – K4	2	K1,K2	2(K2,K2)	2(K3,K3)
	CO4	K1 – K4	2	K1,K2	2(K3,K3)	2(K4,K4)
Question Pattern CIA I & II		No. of Questions to be asked	4		4	4
		No. of Questions to be answered	4		2	2
		Marks for each question	1		5	8
		Total Marks for each section	4		10	16

Distribution of Marks with K Level CIA I & CIA II							
	K Level	Section A (Multiple Choice Questions)	Section B (Either / Or Choice)	Section C (Either / Or Choice)	Total Marks	% of (Marks without choice)	Consolidate of %
CIA I	K1	2			2	3.6	25
	K2	2	10		12	21.4	
	K3		10	16	26	46.4	46.4
	K4			16	16	28.6	28.6
	Marks	4	20	32	56	100	100
CIA II	K1	2			2	3.6	7.2
	K2	2	10		2	3.6	
	K3		10	16	26	46.4	46.4
	K4			16	26	46.4	46.4
	Marks	4	20	32	56	100	100

K1- Remembering and recalling facts with specific answers

K2- Basic understanding of facts and stating main ideas with general answers

K3- Application oriented- Solving Problems

K4- Examining, analyzing, presentation and make inferences with evidences

CO5 will be allotted for individual Assignment which carries five marks as part of CIA component.

Summative Examination – Blue Print Articulation Mapping – K Level with Course Outcomes (COs)						
S. No	Cos	K - Level	Section A (MCQs)		Section B (Either / or Choice) With K - LEVEL	Section C (Either / or Choice) With K - LEVEL
			No. of Questions	K – Level		
1	CO1	K1 – K4	2	K1,K2	2(K2,K2)	2(K3,K3)
2	CO2	K1 – K4	2	K1,K2	2(K3,K3)	2(K4,K4)
3	CO3	K1 – K4	2	K1,K2	2(K2,K2)	2(K3,K3)
4	CO4	K1 – K4	2	K1,K2	2(K3,K3)	2(K4,K4)
5	CO5	K1 – K4	2	K1,K2	2(K3,K3)	2(K4,K4)
No. of Questions to be Asked			10		10	10
No. of Questions to be answered			10		5	5
Marks for each question			1		5	8
Total Marks for each section			10		25	40
(Figures in parenthesis denotes, questions should be asked with the given K level)						

Distribution of Marks with K Level						
K Level	**Section A (Multiple Choice Questions)**	**Section B (Either or Choice**	**Section C (Either/ or Choice)**	**Total Marks**	**% of (Marks without choice)**	**Consolidated %**
K1	**5**			**5**	**3.6**	**4**
K2	**5**	**20**		**25**	**17.8**	**18**
K3		**30**	**32**	**62**	**44.3**	**44**
K4			**48**	**48**	**34.3**	**34**
Marks	**10**	**50**	**80**	**140**	**100**	**100**
NB: Higher level of performance of the students is to be assessed by attempting higher level of K levels.						

Summative Examinations - Question Paper – Format

Q. No.	**Unit**	**CO**	**K-level**		
Answer **ALL** the questions			**PART – A**		**(10 x 1 = 10 Marks)**
1.	**Unit - I**	**CO1**	**K1**		
				a)	b)
				c)	d)
2.	**Unit - I**	**CO1**	**K2**		
				a)	b)
				c)	d)
3.	**Unit - II**	**CO2**	**K1**		
				a)	b)
				c)	d)
4.	**Unit - II**	**CO2**	**K2**		
				a)	b)
				c)	d)
5.	**Unit - III**	**CO3**	**K1**		
				a)	b)
				c)	d)
6.	**Unit - III**	**CO3**	**K2**		
				a)	b)
				c)	d)
7.	**Unit - IV**	**CO4**	**K1**		
				a)	b)
				c)	d)
8.	**Unit - IV**	**CO4**	**K2**		
				a)	b)
				c)	d)
9.	**Unit - V**	**CO5**	**K1**		
				a)	b)
				c)	d)
10.	**Unit - V**	**CO5**	**K2**		
				a)	b)
				c)	d)

Answer **ALL** the questions		**PART – B**		**(5 x 5 = 25 Marks)**
11. a)	**Unit - I**	**CO1**	**K2**	
		OR		
11. b)	**Unit - I**	**CO1**	**K2**	
12. a)	**Unit - II**	**CO2**	**K3**	
		OR		
12. b)	**Unit - II**	**CO2**	**K3**	
13. a)	**Unit - III**	**CO3**	**K2**	
		OR		
13. b)	**Unit - III**	**CO3**	**K2**	
14. a)	**Unit - IV**	**CO4**	**K3**	
		OR		
14. b)	**Unit - IV**	**CO4**	**K3**	
15. a)	**Unit - V**	**CO5**	**K3**	
		OR		
15. b)	**Unit - V**	**CO5**	**K3**	

Answer **ALL** the questions		**PART – C**		**(5 x 8 = 40 Marks)**
16. a)	**Unit - I**	**CO1**	**K3**	
		OR		
16. b)	**Unit - I**	**CO1**	**K3**	
17. a)	**Unit - II**	**CO2**	**K4**	
		OR		
17. b)	**Unit - II**	**CO2**	**K4**	
18. a)	**Unit - III**	**CO3**	**K3**	
		OR		
18. b)	**Unit - III**	**CO3**	**K3**	
19. a)	**Unit - IV**	**CO4**	**K4**	
		OR		
19. b)	**Unit - IV**	**CO4**	**K4**	
20. a)	**Unit - V**	**CO5**	**K4**	
		OR		
20. b)	**Unit - V**	**CO5**	**K4**	

Course Name	INTEGRAL CALCULUS			
Course Code	23UMTCC22	**L**	**P**	**C**
Category	CORE	4	-	4

COURSE OBJECTIVES:

- Knowledge on integration and its geometrical applications, double, triple integrals and improper integrals.
- Knowledge about Beta and Gamma functions and their applications.
- Skills to Determine Fourier series expansions.

UNIT – I **12**

Reduction formulae -Types, integration of product of powers of algebraic and trigonometric functions, integration of product of powers of algebraic and logarithmic functions - Bernoulli's formula.

UNIT – II **12**

Multiple Integrals - definition of double integrals - evaluation of double integrals- Changing of order of integration – double integrals in polar coordinates.

UNIT - III **12**

Triple integrals –applications of multiple integrals - volumes of solids of revolution - volumes of solids of revolution as double integrals- volume as a triple integral–change of variables – Jacobian.

UNIT – IV **12**

Beta and Gamma functions – infinite integral - definitions–recurrence formula of Gamma functions – properties of Beta and Gamma functions- relation between Beta and Gamma functions.

UNIT – V **12**

Geometric and Physical Applications of Integral calculus.

Total Lecture Hours **60**

BOOKS FOR STUDY:

- **Narayanan. S and Manickavasagam Pillai. T.K, Calculus Volume II , (2015)**

  Unit I : Chapter 1 : Sections 13.1 to 13.10 and 15.1

  Unit II : Chapter 5: Sections 2.1 & 2.2 and 3.1 & 3.2

  Unit III: Chapter 5 : Sections 4 & 5.1 to 5.4 and 6.1 to 6.3

  Chapter 6: Sections 1.1 & 1.2

  Unit IV : Chapter 7: Sections 1.1 to 1.5 and 2.1 to 2.3 and 3 & 4

  Unit V: Chapter 2: Sections 1.1 to 1.4 and 2.1 only

BOOKS FOR REFERENCES:

- Bali. N. P, **Integral Calculus**, Laxmi Publications, (1991), Delhi.
- Arumugam. S and Isaac**, Calculus,** New Gamma Publishing House, 2008, Palayamkottai.
- George B.Thomas, Maurice D.Weir and Joel Hass **Calculus** 12th Edition, Pearson Education, 2015.
- H. Anton, I. Birens and S. Davis, Calculus, John Wiley and Sons, Inc., 2002.
- **G.B. Thomas and R.L. Finney, Calculus, Pearson Education, 2007.**
- **D. Chatterjee, Integral Calculus and Differential Equations, Tata-McGraw Hill Publishing Company Ltd.**
- P. Dyke, An Introduction to Laplace Transforms and Fourier Series, Springer Undergraduate Mathematics Series, 2001 (second edition).

WEB RESOURCES:

- **https://nptel.ac.in**
- **https;//www.mathwarehous.com/**
- **https;//www.mathhelp.com/**
- **https;//www.mathsisfun.com/**

Nature of Course	EMPLOYABILITY		✓	SKILL ORIENTED		ENTREPRENEURSHIP		
Curriculum Relevance	LOCAL		REGIONAL		✓	NATIONAL	GLOBAL	
Changes Made in the Course	Percentage of Change		**40**	No Changes Made		New Course		

*** Treat 20% as each unit (20*5=100%) and calculate the percentage of change for the course.**

COURSE OUTCOMES:		K LEVEL
After studying this course, the students will be able to:		
CO1	Determine the integrals of algebraic, trigonometric and logarithmic functions and to find the reduction formulae	K1 to K4
CO2	Evaluate double and triple integrals and problems using change of order of integration	K1 to K4
CO3	Solve multiple integrals and to find the areas of curved surfaces and volumes of solids of revolution	K1 to K4
CO4	Explain beta and gamma functions and to use them in solving problems of integration	K1 to K4
CO5	Explain Geometric and Physical applications of integral calculus	K1 to K4

MAPPING WITH PROGRAM OUTCOMES:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	1	3	-	-	-				
CO2	3	1	3	-	-	-				
CO3	3	1	3	-	-	-				
CO4	3	1	3	-	-	-				
CO5	3	1	3	-	2	1				

S- STRONG M – MEDIUM L - LOW

CO / PO MAPPING:

COS	PSO1	PSO2	PSO3	PSO4	PSO5
CO 1	3	2	1		
CO 2	3	2	1		
CO 3	3	2	1		
CO 4	3	2	1		
CO 5	3	2	1		
WEIGHTAGE	15	10	5		
WEIGHTED PERCENTAGE OF COURSE CONTRIBUTION TO POS	3	2	1		

LESSON PLAN:

UNIT	INTEGRAL CALCULUS	HRS	PEDAGOGY
I	Reduction formulae -Types, integration of product of powers of algebraic and trigonometric functions, integration of product of powers of algebraic and logarithmic functions - Bernoulli's formula.	12	Chalk & Talk
II	Multiple Integrals - definition of double integrals - evaluation of double integrals- Changing of order of integration – double integrals in polar coordinates.	12	Chalk & Talk
III	Triple integrals –applications of multiple integrals - volumes of solids of revolution - volumes of solids of revolution as double integrals- volume	12	Chalk &

	as a triple integral–change of variables – Jacobian.		**Talk**
IV	Beta and Gamma functions – infinite integral - definitions–recurrence formula of Gamma functions – properties of Beta and Gamma functions- relation between Beta and Gamma functions.	**12**	**Chalk & Talk**
V	Geometric and Physical Applications of Integral calculus.	**12**	**Chalk & Talk**

Learning Outcome Based Education & Assessment (LOBE) Formative Examination - Blue Print Articulation Mapping – K Levels with Course Outcomes (COs)						
Internal	**Cos**	**K Level**	**Section A**		**Section B Either or Choice**	**Section C Either or Choice**
			MCQs			
			No. of. Questions	**K - Level**		
CI AI	**CO1**	**K1 – K4**	2	K1,K2	2(K2,K2)	2(K3,K3)
	CO2	**K1 – K4**	2	K1,K2	2(K3,K3)	2(K4,K4)
CI AII	**CO3**	**K1 – K4**	2	K1,K2	2(K2,K2)	2(K3,K3)
	CO4	**K1 – K4**	2	K1,K2	2(K3,K3)	2(K4,K4)
Question Pattern CIA I & II		**No. of Questions to be asked**	4		4	4
		No. of Questions to be answered	4		2	2
		Marks for each question	1		5	8
		Total Marks for each section	4		10	16

Distribution of Marks with K Level CIA I & CIA II							
	K Level	Section A (Multiple Choice Questions)	Section B (Either / Or Choice)	Section C (Either / Or Choice)	Total Marks	% of (Marks without choice)	Consolidate of %
CIA I	K1	2			2	3.6	25
	K2	2	10		12	21.4	
	K3		10	16	26	46.4	46.4
	K4			16	16	28.6	28.6
	Marks	4	20	32	56	100	100
CIA II	K1	2			2	3.6	7.2
	K2	2	10		2	3.6	
	K3		10	16	26	46.4	46.4
	K4			16	26	46.4	46.4
	Marks	4	20	32	56	100	100

K1- Remembering and recalling facts with specific answers

K2- Basic understanding of facts and stating main ideas with general answers

K3- Application oriented- Solving Problems

K4- Examining, analyzing, presentation and make inferences with evidences

CO5 will be allotted for individual Assignment which carries five marks as part of CIA component.

Summative Examination – Blue Print Articulation Mapping – K Level with Course Outcomes (COs)						
S. No	Cos	K - Level	Section A (MCQs)		Section B (Either / or Choice) With K - LEVEL	Section C (Either / or Choice) With K - LEVEL
			No. of Questions	K – Level		
1	CO1	K1 – K4	2	K1,K2	2(K2,K2)	2(K3,K3)
2	CO2	K1 – K4	2	K1,K2	2(K3,K3)	2(K4,K4)
3	CO3	K1 – K4	2	K1,K2	2(K2,K2)	2(K3,K3)
4	CO4	K1 – K4	2	K1,K2	2(K3,K3)	2(K4,K4)
5	CO5	K1 – K4	2	K1,K2	2(K3,K3)	2(K4,K4)
No. of Questions to be Asked			10		10	10
No. of Questions to be answered			10		5	5
Marks for each question			1		5	8
Total Marks for each section			10		25	40
(Figures in parenthesis denotes, questions should be asked with the given K level)						

Distribution of Marks with K Level						
K Level	**Section A (Multiple Choice Questions)**	**Section B (Either or Choice**	**Section C (Either/ or Choice)**	**Total Marks**	**% of (Marks without choice)**	**Consolidated %**
K1	**5**			**5**	**3.6**	**4**
K2	**5**	**20**		**25**	**17.8**	**18**
K3		**30**	**32**	**62**	**44.3**	**44**
K4			**48**	**48**	**34.3**	**34**
Marks	**10**	**50**	**80**	**140**	**100**	**100**
NB: Higher level of performance of the students is to be assessed by attempting higher level of K levels.						

Summative Examinations - Question Paper – Format

Q. No.	**Unit**	**CO**	**K-level**		
Answer **ALL** the questions				**PART – A**	**(10 x 1 = 10 Marks)**
1.	**Unit - I**	**CO1**	**K1**		
				a)	b)
				c)	d)
2.	**Unit - I**	**CO1**	**K2**		
				a)	b)
				c)	d)
3.	**Unit - II**	**CO2**	**K1**		
				a)	b)
				c)	d)
4.	**Unit - II**	**CO2**	**K2**		
				a)	b)
				c)	d)
5.	**Unit - III**	**CO3**	**K1**		
				a)	b)
				c)	d)
6.	**Unit - III**	**CO3**	**K2**		
				a)	b)
				c)	d)
7.	**Unit - IV**	**CO4**	**K1**		
				a)	b)
				c)	d)
8.	**Unit - IV**	**CO4**	**K2**		
				a)	b)
				c)	d)
9.	**Unit - V**	**CO5**	**K1**		
				a)	b)
				c)	d)
10.	**Unit - V**	**CO5**	**K2**		
				a)	b)
				c)	d)

Answer **ALL** the questions		**PART – B**		**(5 x 5 = 25 Marks)**
11. a)	**Unit - I**	**CO1**	**K2**	
		OR		
11. b)	**Unit - I**	**CO1**	**K2**	
12. a)	**Unit - II**	**CO2**	**K3**	
		OR		
12. b)	**Unit - II**	**CO2**	**K3**	
13. a)	**Unit - III**	**CO3**	**K2**	
		OR		
13. b)	**Unit - III**	**CO3**	**K2**	
14. a)	**Unit - IV**	**CO4**	**K3**	
		OR		
14. b)	**Unit - IV**	**CO4**	**K3**	
15. a)	**Unit - V**	**CO5**	**K3**	
		OR		
15. b)	**Unit - V**	**CO5**	**K3**	

Answer **ALL** the questions		**PART – C**		**(5 x 8 = 40 Marks)**
16. a)	**Unit - I**	**CO1**	**K3**	
		OR		
16. b)	**Unit - I**	**CO1**	**K3**	
17. a)	**Unit - II**	**CO2**	**K4**	
		OR		
17. b)	**Unit - II**	**CO2**	**K4**	
18. a)	**Unit - III**	**CO3**	**K3**	
		OR		
18. b)	**Unit - III**	**CO3**	**K3**	
19. a)	**Unit - IV**	**CO4**	**K4**	
		OR		
19. b)	**Unit - IV**	**CO4**	**K4**	
20. a)	**Unit - V**	**CO5**	**K4**	
		OR		
20. b)	**Unit - V**	**CO5**	**K4**	

Course Name	ALLIED PHYSICS – II			
Course Code	23UPHEA21	**L**	**P**	**C**
Category	ALLIED PAPER	3	-	3

COURSE OBJECTIVES:

- To understand the basic concepts of optics, modern Physics, concepts of relativity and quantum physics, semiconductor physics, and electronics.

UNIT - I OPTICS **09**

Interference – interference in thin films – colors of thin films – air wedge – determination of diameter of a thin wire by air wedge – diffraction – normal incidence – experimental determination of wavelength using diffraction grating (no theory) – polarization – polarization by double reflection – Brewster's law – optical activity

UNIT - II ATOMIC PHYSICS **09**

Atom models – Bohr atom model – mass number – atomic number – nucleons – vector atom model – various quantum numbers – Pauli's exclusion principle – electronic configuration – periodic classification of elements – photo electric effect – Einstein's photoelectric equation

UNIT - III NUCLEAR PHYSICS **09**

Nuclear models – liquid drop model – magic numbers – shell model – nuclear energy – mass defect – binding energy – radioactivity – uses – half life – mean life - radio isotopes and uses – controlled and uncontrolled chain reaction – nuclear fission – energy released in fission – chain reaction – critical reaction – critical size- atom bomb – nuclear reactor – breeder reactor

UNIT - IV INTRODUCTION TO RELATIVITY **09**

Frame of reference – postulates of special theory of relativity – Galilean transformation equations – Lorentz transformation equations – derivation – length contraction – time dilation – twin paradox – mass-energy equivalence

UNIT - V SEMICONDUCTOR PHYSICS **09**

p-n junction diode – forward and reverse biasing – characteristic of diode – zener diode – characteristic of zener diode – voltage regulator – full wave bridge rectifier – construction and working – advantages (no mathematical treatment)

Total Lecture Hours	**45**

BOOKS FOR STUDY:

- R.Murugesan (2005), Allied Physics, S.Chand & Co, New Delhi.
- K.Thangaraj and D.Jayaraman (2004), Allied Physics, Popular Book Depot, Chennai.
- Brijlal and N.Subramanyam (2002), Text book of Optics, S.Chand & Co, New Delhi.
- R.Murugesan (2005), Modern Physics, S.Chand & Co, New Delhi.
- A.Subramaniyam, Applied Electronics, 2nd Edn., National Publishing Co., Chennai.

BOOKS FOR REFERENCES:

- Resnick Halliday and Walker (2018), Fundamentals of Physics, 11th Edn., John Willey and Sons, Asia Pvt. Ltd., Singapore.
- D.R.Khanna and H.R. Gulati (1979). Optics, S.Chand & Co. Ltd., New Delhi.
- A.Beiser (1997), Concepts of Modern Physics, Tata McGraw Hill Publication, New Delhi.
- Thomas L. Floyd (2017), Digital Fundamentals, 11th Edn., Universal Book Stall, New Delhi.
- V.K.Metha (2004), Principles of electronics, 6th Edn. , S.Chand and Company, New Delhi.

WEB RESOURCES:

- **https://www.berkshire.com/learningcenter/deltapfacemask/https://www.youtube.com/watch?v=QrhxU47gtj4https://www.youtube.com/watch?timcontinue=318&v=D38BjgUdL5U&feature=emb_logo**
- **https://www.youtube.com/watch?v=JrRrp5F-Qu4**
- **https://www.validyne.com/blog/leak-test-using-pressure-transducers/**
- **https://www.atoptics.co.uk/atoptics/blsky.htm -**
- **https://www.metoffice.gov.uk/weather/learn-about/weather/optical-effects**

Nature of Course	EMPLOYABILITY	✓	SKILL ORIENTED		ENTREPRENEURSHIP			
Curriculum Relevance	LOCAL		REGIONAL		NATIONAL		GLOBAL	✓
Changes Made in the Course	Percentage of Change	**85**	No Changes Made		New Course			

*** Treat 20% as each unit (20*5=100%) and calculate the percentage of change for the course.**

COURSE OUTCOMES:		K LEVEL
After studying this course, the students will be able to:		
CO1	Explain the concepts of interference, diffraction using principles of superposition of waves and rephrase the concept of polarization based on wave patterns	K1 to K4
CO2	Outline the basic foundation of different atom models and various experiments establishing quantum concepts. Relate the importance of interpreting improving theoretical models based on observation. Appreciate inter disciplinary nature of science and in solar energy related applications.	K1 to K4
CO3	Summarize the properties of nuclei, nuclear forces, structure of atomic nucleus and nuclear models. Solve problems on delay rate half-life and mean-life. Interpret nuclear processes like fission and fusion.	K1 to K4
CO4	To describe the basic concepts of relativity like equivalence principle, inertial frames and Lorentz transformation. Extend their knowledge on concepts of relativity and vice versa.	K1 to K4
CO5	Summarize the working of semiconductor devices like junction diode, Zener diode and power supplies that are practically used in daily life	K1 to K4

MAPPING WITH PROGRAM OUTCOMES:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	3	2	2	3	2	2	3	2	3
CO2	2	3	3	3	2	2	3	2	3	3
CO3	3	2	3	2	3	3	2	3	3	3
CO4	3	3	3	3	3	2	3	2	2	2
CO5	2	2	3	3	2	3	3	3	3	2

S- STRONG M – MEDIUM L - LOW

CO / PO MAPPING:

COS	PSO1	PSO2	PSO3	PSO4	PSO5
CO 1	3	1	3	-	2
CO 2	3	1	3	-	2
CO 3	3	1	3	-	2
CO 4	3	1	3	-	2
CO 5	3	1	3	-	2
WEITAGE					
WEIGHTED PERCENTAGE OF COURSE CONTRIBUTION TO POS					

LESSON PLAN:			
UNIT	**ALLIED PHYSICS –II**	**HRS**	**PEDAGOGY**
I	Interference – interference in thin films – colors of thin films – air wedge – determination of diameter of a thin wire by air wedge – diffraction – normal incidence – experimental determination of wavelength using diffraction grating (no theory) – polarization – polarization by double reflection – Brewster's law – optical activity	**9**	**Lecture method, PPT, Demonstration**
II	Atom models – Bohr atom model – mass number – atomic number – nucleons – vector atom model – various quantum numbers – Pauli's exclusion principle – electronic configuration – periodic classification of elements – photo electric effect – Einstein's photoelectric equation	**9**	**Lecture method, PPT, Demonstration**
III	Nuclear models – liquid drop model – magic numbers – shell model – nuclear energy – mass defect – binding energy – radioactivity – uses – half life – mean life - radio isotopes and uses – controlled and uncontrolled chain reaction – nuclear fission – energy released in fission – chain reaction – critical reaction – critical size- atom bomb – nuclear reactor – breeder reactor	**9**	**Lecture method, PPT, Demonstration**
IV	Frame of reference – postulates of special theory of relativity – Galilean transformation equations – Lorentz transformation equations – derivation – length contraction – time dilation – twin paradox – mass-energy equivalence	**9**	**Lecture method, PPT, Demonstration**
V	p-n junction diode – forward and reverse biasing – characteristic of diode – zener diode – characteristic of zener diode – voltage regulator – full wave bridge rectifier – construction and working – advantages (no mathematical treatment)	**9**	**Lecture method, PPT, Demonstration**

Learning Outcome Based Education & Assessment (LOBE) Formative Examination - Blue Print Articulation Mapping – K Levels with Course Outcomes (COs)						
Internal	**Cos**	**K Level**	**Section A**		**Section B Either or Choice**	**Section C Either or Choice**
			MCQs			
			No. of. Questions	**K - Level**		
CI AI	**CO1**	**K1 – K4**	2	K1, K2	K1 OR K1	K3 OR K3
	CO2	**K1 – K4**	2	K1,K2	K2 OR K2	K4 OR K4
CI AII	**CO3**	**K1 – K4**	2	K1, K2	K2 OR K2	K3 OR K3
	CO4	**K1 – K4**	2	K1,K2	K3 OR K3	K4 OR K4
Question Pattern CIA I & II		**No. of Questions to be asked**	4		4	4
		No. of Questions to be answered	4		2	2
		Marks for each question	1		5	8
		Total Marks for each section	4		10	16

Distribution of Marks with K Level CIA I & CIA II							
	K Level	**Section A (Multiple Choice Questions)**	**Section B (Either / Or Choice)**	**Section C (Either / Or Choice)**	**Total Marks**	**% of (Marks without choice)**	**Consolidate of %**
CIA I	**K1**	**2**	**10**	**-**	**12**	**21.43**	**-**
	K2	**2**	**10**	**-**	**12**	**21.43**	
	K3	**-**	**-**	**16**	**16**	**28.57**	**42.86**
	K4	**-**	**-**	**16**	**16**	**28.57**	**71.43**
	Marks	**4**	**20**	**32**	**56**	**100**	**100**
CIA II	**K1**	**2**			**2**	**3.57**	**-**
	K2	**2**	**10**		**12**	**21.43**	
	K3		**10**	**16**	**26**	**46.43**	**25.00**
	K4			**16**	**16**	**28.57**	**71.43**
	Marks	**4**	**20**	**32**	**56**	**100**	**100**

K1- Remembering and recalling facts with specific answers

K2- Basic understanding of facts and stating main ideas with general answers

K3- Application oriented- Solving Problems

K4- Examining, analyzing, presentation and make inferences with evidences

CO5 will be allotted for individual Assignment which carries five marks as part of CIA component.

Summative Examination – Blue Print Articulation Mapping – K Level with Course Outcomes (COs)						
S. No	COs	K - Level	Section A (MCQs)		Section B (Either / or Choice) With K - LEVEL	Section C (Either / or Choice) With K - LEVEL
			No. of Questions	K – Level		
1	CO1	K1, K2	2	K1, K2	K1, K1	K2, K2
2	CO2	K1, K2	2	K1, K2	K2, K2	K2, K2
3	CO3	K1, K2	2	K1, K2	K2, K2	K3, K3
4	CO4	K1, K2	2	K1, K2	K3, K3	K3, K3
5	CO5	K1, K2	2	K1, K2	K4, K4	K4, K4
No. of Questions to be Asked			10		10	10
No. of Questions to be answered			10		5	5
Marks for each question			1		5	8
Total Marks for each section			10		25	40
(Figures in parenthesis denotes, questions should be asked with the given K level)						

Distribution of Marks with K Level						
K Level	Section A (Multiple Choice Questions)	Section B (Either or Choice	Section C (Either/ or Choice)	Total Marks	% of (Marks without choice)	Consolidated %
K1	5	10		15	10.72	-
K2	5	20	32	57	40.71	51.43
K3		10	32	42	30.00	30.00
K4		10	16	26	18.57	18.57
Marks	10	50	80	140	100	100
NB: Higher level of performance of the students is to be assessed by attempting higher level of K levels.						

Summative Examinations - Question Paper – Format

Q. No.	Unit	CO	K-level		
Answer **ALL** the questions			**PART – A**		**(10 x 1 = 10 Marks)**
1.	**Unit - I**	**CO1**	**K1**		
				a)	b)
				c)	d)
2.	**Unit - I**	**CO1**	**K2**		
				a)	b)
				c)	d)
3.	**Unit - II**	**CO2**	**K1**		
				a)	b)
				c)	d)
4.	**Unit - II**	**CO2**	**K2**		
				a)	b)
				c)	d)
5.	**Unit - III**	**CO3**	**K1**		
				a)	b)
				c)	d)
6.	**Unit - III**	**CO3**	**K2**		
				a)	b)
				c)	d)
7.	**Unit - IV**	**CO4**	**K1**		
				a)	b)
				c)	d)
8.	**Unit - IV**	**CO4**	**K2**		
				a)	b)
				c)	d)
9.	**Unit - V**	**CO5**	**K1**		
				a)	b)
				c)	d)
10.	**Unit - V**	**CO5**	**K2**		
				a)	b)
				c)	d)

Answer **ALL** the questions		**PART – B**		**(5 x 5 = 25 Marks)**
11. a)	**Unit - I**	**CO1**	**K1**	
		OR		
11. b)	**Unit - I**	**CO1**	**K1**	
12. a)	**Unit - II**	**CO2**	**K2**	
		OR		
12. b)	**Unit - II**	**CO2**	**K2**	
13. a)	**Unit - III**	**CO3**	**K2**	
		OR		
13. b)	**Unit - III**	**CO3**	**K2**	
14. a)	**Unit - IV**	**CO4**	**K3**	
		OR		
14. b)	**Unit - IV**	**CO4**	**K3**	
15. a)	**Unit - V**	**CO5**	**K4**	
		OR		
15. b)	**Unit - V**	**CO5**	**K4**	

Answer **ALL** the questions		**PART – C**		**(5 x 8 = 40 Marks)**
16. a)	**Unit - I**	**CO1**	**K2**	
		OR		
16. b)	**Unit - I**	**CO1**	**K2**	
17. a)	**Unit - II**	**CO2**	**K2**	
		OR		
17. b)	**Unit - II**	**CO2**	**K2**	
18. a)	**Unit - III**	**CO3**	**K3**	
		OR		
18. b)	**Unit - III**	**CO3**	**K3**	
19. a)	**Unit - IV**	**CO4**	**K3**	
		OR		
19. b)	**Unit - IV**	**CO4**	**K3**	
20. a)	**Unit - V**	**CO5**	**K4**	
		OR		
20. b)	**Unit - V**	**CO5**	**K4**	

Course Name	ALLIED PHYSICS PRACTICALS – II			
Course Code	23UPHEP21	**L**	**P**	**C**
Category	ALLIED PRACTICAL	**-**	**2**	**2**

COURSE OBJECTIVES:

- Apply various Physics concepts to understand concepts of Light, electricity and magnetism and waves, set up experimentation to verify theories, quantify and analyse, able to do error analysis and correlate results

SEMESTER - I LIST OF EXPERIMENTS 30

Minimum of Eight Experiments from the list:

1. Radius of curvature of lens by forming Newton's rings
2. Thickness of a wire using air wedge
3. Wavelength of mercury lines using spectrometer and grating
4. Refractive index of material of the lens by minimum deviation
5. Refractive index of liquid using liquid prism
6. Determination of AC frequency using sonometer
7. Specific resistance of a wire using PO box
8. Thermal conductivity of poor conductor using Lee's disc
9. Determination of figure of merit table galvanometer
10. Determination of Earth's magnetic field using field along the axis of a coil
11. Characterisation of Zener diode
12. Construction of Zerner/IC regulated power supply
13. Construction of AND, OR, NOT gates using diodes and transistor
14. NOR gate as a universal building block

Note : Use of digital balance permitted

Total Lecture Hours **30**

BOOKS FOR STUDY:

- Srinivasan.M.N., Balasubramanian.S., Ranganathan.R., A Text Book of Practical Physics, 2017 Edition, Sultan Chand & Sons

BOOKS FOR REFERENCES:

- Ouseph.C., Practical Physics and Electronics, 2013, S.Viswanathan.P.Ltd.
- Practical Physics and Electronics, C.C.Ouseph, U.J.Rao, V.Vijayendran, S.Viswanathan Publishers (2007)

WEB RESOURCES:

- **https://nptel.ac.in/course.html/physics/experimental physics I, II and III**
- **https://nptel.ac.in/courses/115/105/115105110/**
- **https://www.youtube.com/playlist?list=PLuiPz6iU5SQ8-rZn_LgLofRX7n8z4tHYK**

Nature of Course	EMPLOYABILITY		SKILL ORIENTED	✓	ENTREPRENEURSHIP			
Curriculum Relevance	LOCAL		REGIONAL		NATIONAL		GLOBAL	✓
Changes Made in the Course	Percentage of Change	**70**	No Changes Made		New Course			
*** Treat 20% as each unit (20*5=100%) and calculate the percentage of change for the course.**								

COURSE OUTCOMES:		**K LEVEL**
After studying this course, the students will be able to:		
CO1	Remembering the Aim and apparatus used in the experiment	**K1**
CO2	Understanding of laws and formulas of the experiment	**K2**
CO3	Applying the knowledge to do the experiment	**K4**
CO4	Calculating and examining the aim of the experiment	**K3**
CO5	Interpreting the result of the experiment	**K2**

MAPPING WITH PROGRAM OUTCOMES:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	3	1	1	2	3	3	3	1	3
CO2	3	3	2	2	2	3	3	3	1	3
CO3	3	3	3	3	3	3	3	3	2	3
CO4	3	3	2	3	3	3	3	3	1	3
CO5	3	3	2	2	2	3	3	3	1	3

3 - STRONG **2 – MEDIUM** **1 - LOW**

CO / PO MAPPING:

COS	PSO1	PSO2	PSO3	PSO4	PSO5
CO 1	3	2	3	-	2
CO 2	3	2	3	-	2
CO 3	3	2	3	-	2
CO 4	3	2	3	-	2
CO 5	3	2	3	-	2
WEITAGE					
WEIGHTED PERCENTAGE OF COURSE CONTRIBUTION TO POS					

LESSON PLAN:			
SEM	**ALLIED PHYSICS PRACTICALS – II**	**HRS**	**PEDAGOGY**
I	1. Radius of curvature of lens by forming Newton's rings 2. Wavelength of mercury lines using spectrometer and grating 3. Determination of AC frequency using sonometer 4. Thermal conductivity of poor conductor using Lee's disc 5. Determination of figure of merit table galvanometer 6. Characterisation of Zener diode 7. Construction of Zerner regulated power supply 8. NOR gate as a universal building block	**30**	**Demonstration and Video**

Learning Outcome Based Education & Assessment (LOBE) Formative Examination - Blue Print Articulation Mapping – K Levels with Course Outcomes (COs)				
Internal	**Cos**	**K Level**	**No. of. Questions**	**K - Level**
CIA-I	**CO1 - CO5**	**K1 – K4**	**1** Question for Each Student	**K1 – K4**
Question Pattern CIA - I		No. of Questions to be asked	**1** Question for Each Student	
		No. of Questions to be answered	**1**	
		Marks for each question	**30**	
		Total Marks for each section	**30**	

Distribution of Marks with COs & K Level for Correction of CIA I				
	COs	**Distribution of the work of the experiment**	**K - Level**	**MARKS**
CIA I	**CO1**	Aim and apparatus	**K1**	**2.0**
	CO2	Formula and Tabular Column	**K2**	**5**
	CO3	Understanding and Observation	**K4**	**12.0**
	CO4	Calculation and Graph	**K3**	**8.0**
	CO5	Interpretation of result	**K2**	**3.0**
	Total Marks			**30**

Distribution of Marks with K Level CIA I					
	K Level	**Distribution of the work of the experiment**	**Total Marks**	**% of (Marks without choice)**	**Consolidate of %**
CIA I	**K1**	Aim and apparatus	2	6.66	-
	K2	Formula and Tabular Column Interpretation of result	8	26.67	
	K3	Understanding and Observation	8	26.67	**33.33**
	K4	Calculation and Graph	12	40.00	**60.00**
	Marks		**30**	**100**	**100**

K1- Remembering and recalling facts with specific answers

K2- Basic understanding of facts and stating main ideas with general answers

K3- Application oriented- Solving Problems

K4- Examining, analyzing, presentation and make inferences with evidences

CO5 will be allotted for individual Assignment which carries five marks as part of CIA component.

Summative Examination – Blue Print Articulation Mapping – K Level with Course Outcomes (COs)			
COs	**K - Level**	**No. of Questions**	**K – Level**
CO1 - CO5	**K1 – K4**	**1** Question for Each Student	**K1 – K4**
No. of Questions to be Asked		**1** Question for Each Student	
No. of Questions to be answered		**1**	
Marks for each question		**60**	
Total Marks for each section		**60**	
(Figures in parenthesis denotes, questions should be asked with the given K level)			

Distribution of Marks with COs & K Level for Correction of the Summative Exam			
COs	**Distribution of the work of the experiment**	**K - Level**	**MARKS**
CO1	Aim and apparatus	**K1**	**5**
CO2	Formula and Tabular Column	**K2**	**10**
CO3	Understanding and Observation	**K4**	**25**
CO4	Calculation and Graph	**K3**	**15**
CO5	Interpretation of result	**K2**	**5**
Total Marks			**60**

Distribution of Marks with K Level				
K Level	**Parameters for K-Level**	**Total Marks**	**% of (Marks without choice)**	**Consolidated %**
K1	Aim and apparatus	**5**	**8.33**	**-**
K2	Formula and Tabular Column, Interpretation of result	**15**	**25.00**	**8.33**
K3	Understanding and Observation	**25**	**41.67**	**33.33**
K4	Calculation and Graph	**15**	**25.00**	**75.00**
Marks		**60**	**100**	**100**
NB: Higher level of performance of the students is to be assessed by attempting higher level of K levels.				

Course Name	MATHEMATICS FOR COMPETITIVE EXAMINATION - II			
Course Code	23UMTNM21	**L**	**P**	**C**
Category	NON MAJOR ELECTIVE	2	-	2

COURSE OBJECTIVES:

- To improve the ability to face the competitive examinations
- To identify the exact method to problems
- To apply the concepts in Competitive Examinations.
- To familiarize the concepts of HCF, LCM, Calendar, Rules of alligation.
- To identify verbal and non – verbal problems

UNIT – I	**6**
Finding LCM, HCF – Problems on decimals and fractions.	
UNIT – II	**6**
Problems relating relation between the ages.	
UNIT - III	**6**
Alligation – Mean price - Rule of alligation.	
UNIT – IV	**6**
Calendar – Leap Year – Non Leap Year – Number of Days between Dates	
UNIT - V	**6**
Non Verbal Reasoning – Completion of Figures – Completion of Series.	
Total Lecture Hours	**30**

BOOKS FOR STUDY:

- Text Material will be supplied by the Department

BOOKS FOR REFERENCES:

- Aggarwal. R.S, **Quantitative Aptitude for Competitive Examinations,** S.Chand and Company Ltd, Reprint 2011, New Delhi.
- AbhigitGuha, **Quantitative Aptitude,** fourth edition, Tata MCGraw Hill Publication, 2011, New Delhi.
- BS Sijwali, Indu Sijwali, **Non -Verbal Reasoning,** Arihant Publications (India) LTD., New Delhi

WEB RESOURCES:

- **https;//www.mathwarehous.com/**
- **https;//www.mathhelp.com/**
- **https;//www.mathsisfun.com/**

Nature of Course	EMPLOYABILITY		✓	SKILL ORIENTED			ENTREPRENEURSHIP			
Curriculum Relevance	LOCAL		REGIONAL		✓	NATIONAL		GLOBAL		
Changes Made in the Course	Percentage of Change			No Changes Made		✓	New Course			

*** Treat 20% as each unit (20*5=100%) and calculate the percentage of change for the course.**

COURSE OUTCOMES:		**K LEVEL**
After studying this course, the students will be able to:		
CO1	Explain the LCM, HCF and Decimal values	**K1 to K2**
CO2	Under the relation and concept of ages	**K1 to K2**
CO3	Recall the rules of allegation	**K1 to K2**
CO4	Illustrate the concepts related to calendar	**K1 to K2**
CO5	Classify the non-verbal reasoning problems	**K1 to K2**

MAPPING WITH PROGRAM OUTCOMES:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	2	2	3	3	3	3				
CO2	2	3	2	3	2	3				
CO3	3	2	3	2	3	3				
CO4	3	2	3	2	2	3				
CO5	2	3	3	3	2	2				

S - STRONG **M – MEDIUM** **L - LOW**

CO / PO MAPPING:

COS	PSO1	PSO2	PSO3	PSO4	PSO5
CO 1	3	2	1		
CO 2	3	2	1		
CO 3	3	2	1		
CO 4	3	2	1		
CO 5	3	2	1		
WEIGHTAGE	15	10	5		
WEIGHTED PERCENTAGE OF COURSE CONTRIBUTION TO POS	3	2	1		

LESSON PLAN:

UNIT	MATHEMATICS FOR COMPETITIVE EXAMINATION- II	HRS	PEDAGOGY
I	LCM, HCF, Decimals	6	Chalk & Talk
II	Relation between ages	6	Chalk & Talk
III	Alligation – Mean price - Rule of alligation.	6	Chalk & Talk
IV	Calendar – Leap Year – Non Leap Year – Number of Days between Dates	6	Chalk & Talk
V	Non Verbal Reasoning – Completion of Figures – Completion of Series.	6	Chalk & Talk

Learning Outcome Based Education & Assessment (LOBE) Formative Examination - Blue Print Articulation Mapping – K Levels with Course Outcomes (COs)				
Internal	Cos	K Level	Section A	
			MCQs	
			No. of. Questions	K - Level
CI AI	CO1	K1 – K2	25	K1,K2
	CO2	K1 – K2	25	K1,K2
CI AII	CO3	K1 – K2	25	K1,K2
	CO4	K1 – K2	25	K1,K2
Question Pattern CIA I & II		No. of Questions to be asked	50	
		No. of Questions to be answered	50	
		Marks for each question	1	
		Total Marks for each section	50	

* Two Formative examinations will be conducted as a part of Continuous Internal Assessment under which, 50 MCQ's will be asked [50X1=50 marks] from any 4 CO's. (I^{st} Test-2 CO's & II^{nd} Test-2 CO's) in equal weightage

Distribution of Marks with K Level CIA I & CIA II					
	K Level	**Section A (Multiple Choice Questions)**	**Total Marks**	**% of (Marks without choice)**	**Consolidate of %**
CIA I	**K1**	**30**	**30**	**60**	**100**
	K2	**20**	**20**	**40**	
	K3				
	K4				
	Marks	**50**	**50**	**100**	**100**
CIA II	**K1**	**30**	**30**	**60**	**100**
	K2	**20**	**20**	**40**	
	K3				
	K4				
	Marks	**50**	**50**	**100**	**100**

K1- Remembering and recalling facts with specific answers

K2- Basic understanding of facts and stating main ideas with general answers

K3- Application oriented- Solving Problems

K4- Examining, analyzing, presentation and make inferences with evidences

CO5 will be allotted for individual Assignment which carries five marks as part of CIA component.

Summative Examination – Blue Print Articulation Mapping – K Level with Course Outcomes (COs)				
S. No	COs	K - Level	Section A (MCQs)	
			No. of Questions	K – Level
1	CO1	K1-K2	15	K1,K2
2	CO2	K1-K2	15	K1,K2
3	CO3	K1-K2	15	K1,K2
4	CO4	K1-K2	15	K1,K2
5	CO5	K1-K2	15	K1,K2
No. of Questions to be Asked			75	
No. of Questions to be answered			75	
Marks for each question			1	
Total Marks for each section			75	
(Figures in parenthesis denotes, questions should be asked with the given K level)				

In summative examinations, 75 MCQ's will be asked [75X1=75 marks] from all 5 CO's in equal weightage.

Distribution of Marks with K Level				
K Level	Section A (Multiple Choice Questions)	Total Marks	% of (Marks without choice)	Consolidated %
K1	40	40	53	100
K2	35	35	47	
K3				
K4				
Marks		75	100	100
NB: Higher level of performance of the students is to be assessed by attempting higher level of K levels.				

Course Name	OFFICE AUTOMATION - LAB			
Course Code	23UMTSP21	**L**	**P**	**C**
Category	SKILL PRACTICAL	-	2	2

COURSE OBJECTIVES:

- To improve the employability skill
- To present mathematical concepts in seminar / conference
- To document project works
- To prepare various type of charts for the given data
- To familiarize the office automation tools

List of Programs

1. Type a meaningful message in word document. Give a title for the passage and format the same as per the specification given below:
   - Insert date and time, Title should be in Bold, italics, underlined
   - Font size, style, Line spacing should be doubled
   - Set left margin to 1.5, right margin to 1.75
   - Apply border to the passage
2. Prepare a timetable using Table Auto format in MS Word.
3. Prepare a bio-data in MS Word using wizard.
4. Design an invitation with two column break, use word to insert picture, design border and shading
5. Using mail merge prepare an interview call letter.
6. Create a Student Mark Statement in MS Excel and calculate total, average and percentage using Auto sum.
7. Create a yearly budget of a company and create different types of chart for the data.
8. Create a slide show using blank presentation with at least 20 slides.
9. Present the college details or any publishing work using Auto content wizard.
10. Create a Seminar presentation using insert picture and sound.

BOOKS FOR STUDY:

- C.Nellai Kannan, **MS Office**, Nels Publications, 3rd edition, Tirunelveli, 2004.

BOOKS FOR REFERENCES:

- Sanjay Saxena, **A First course in Computers**, Vikas Publishing House Pvt Ltd Edition, New Delhi, 2003.
- Vikas Gupta, **Comdex Computer Course Kit** , Dream Tech Press Edition, New Delhi, 2003.
- WEBSITE **:** https://www.free-computer-tutorials.net/word-2007.html

WEB RESOURCES:

- **https://www.youtube.com/watch/yCVy5Kw0l8s**
- **https://edu.gcfglobal.org/en/subjects/office/**

Nature of Course	EMPLOYABILITY		SKILL ORIENTED	✓	ENTREPRENEURSHIP			
Curriculum Relevance	LOCAL		REGIONAL	✓	NATIONAL		GLOBAL	
Changes Made in the Course	Percentage of Change		No Changes Made		New Course	✓		

*** Treat 20% as each unit (20*5=100%) and calculate the percentage of change for the course.**

COURSE OUTCOMES:		**K LEVEL**
After studying this course, the students will be able to:		
CO1	have the basic knowledge of Microsoft Office	**K1 to K4**
CO2	Improve the capability on DTP process.	**K1 to K4**
CO3	Encourage the mail merge and sorting process.	**K1 to K4**
CO4	have knowledge of charts and functions	**K1 to K4**
CO5	Create a PowerPoint presentation.	**K1 to K4**

MAPPING WITH PROGRAM OUTCOMES:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	2	2	2	2	3				
CO2	2	2	2	3	3	2				
CO3	2	2	2	2	2	2				
CO4	3	2	3	1	2	1				
CO5	1	2	2	2	1	2				

S- STRONG **M – MEDIUM** **L - LOW**

CO / PO MAPPING:					
COS	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO 1	**3**	**2**	**1**		
CO 2	**3**	**2**	**1**		
CO 3	**3**	**2**	**1**		
CO 4	**3**	**2**	**1**		
CO 5	**3**	**2**	**1**		
WEIGHTAGE	**15**	**10**	**5**		
WEIGHTED PERCENTAGE OF COURSE CONTRIBUTION TO POS	**3**	**2**	**1**		

LESSON PLAN:

UNIT	MS OFFICE	HRS	PEDAGOGY
	1. Type a meaningful message in word document. Give a title for t he passage and format the same as per the specification given below: • Insert date and time, Title should be in Bold, italics, underlined • Font size, style, Line spacing should be doubled • Set left margin to 1.5, right margin to 1.75 • Apply border to the passage **2.** Prepare a timetable using Table Auto format in MS Word. **3.** Prepare a bio-data in MS Word using wizard. **4.** Design an invitation with two column break, use word to insert picture, design border and shading **5.** Using mail merge prepare an interview call letter. **6.** Create a Student Mark Statement in MS Excel and calculate total, average and percentage Using Auto sum. **7.** Create a yearly budget of a company and create different types of chart for the data. **8.** Create a slide show using blank presentation with at least 20 slides. **9.** Present the college details or any publishing work using Auto content wizard. **10.** Create a Seminar presentation using insert picture and sound.	**30**	**Demonstration and Video**

Learning Outcome Based Education & Assessment (LOBE) Formative Examination - Blue Print Articulation Mapping – K Levels with Course Outcomes (COs)				
Internal	**Cos**	**K Level**	**No. of Questions**	**K - Level**
CIA I	**CO1- CO5**	**K1 – K4**	**2 Question for Each Student**	**K1-K4**
Question Pattern CIA I		**No. of Questions to be asked**	**2 Question for Each Student**	
		No. of Questions to be answered	**2**	
		Marks for each question		
		Total Marks for each section		

Distribution of Marks with K Level CIA I									
	K Level	**Syntax & Semantics**	**Programming principles**	**Concept Applications**	**Coding**	**Debugging & Output**	**Total Marks**	**% of (Marks without choice)**	**Consolidated %**
CIA I	**K1**	**5**					**5**	**20**	**20**
	K2		**5**				**5**	**20**	**20**
	K3			**5**			**5**	**20**	**20**
	K4				**5**	**5**	**10**	**40**	**40**
	Marks						**25**	**100**	**100**

K1- Remembering and recalling facts with specific answers

K2- Basic understanding of facts and stating main ideas with general answers

K3- Application oriented- Solving Problems

K4- Examining, analyzing, presentation and make inferences with evidences

CO5 will be allotted for individual Assignment which carries five marks as part of CIA component.

Summative Examination – Blue Print Articulation Mapping – K Level with Course Outcomes (COs)				
S. No	COs	K - Level	Section A (MCQs)	
			No. of Questions	K – Level
1	CO1	K1-K2	15	K1,K2
2	CO2	K1-K2	15	K1,K2
3	CO3	K1-K2	15	K1,K2
4	CO4	K1-K2	15	K1,K2
5	CO5	K1-K2	15	K1,K2
No. of Questions to be Asked			2	
No. of Questions to be answered			2	
Marks for each question			36.5	
Total Marks for each section			75	
(Figures in parenthesis denotes, questions should be asked with the given K level)				

Distribution of Marks with K Level				
K Level	Section A (Multiple Choice Questions)	Total Marks	% of (Marks without choice)	Consolidated %
K1	40	40	53	100
K2	35	35	47	
K3				
K4				
Marks		75	100	100
NB: Higher level of performance of the students is to be assessed by attempting higher level of K levels.				