MANNAR THIRUMALAI NAICKER COLLEGE PASUMALAI, MADURAI- 625 004

(An Autonomous Institution Affiliated to Madurai Kamaraj University)

(Re-accredited with 'A' Grade by NAAC)



B.Sc., Mathematics

SYLLABUS AND REGULATIONS

UNDER CHOICE BASED CREDIT SYSTEM (CBCS) (For those who joined during 2018-2019 and after)

Qualification for Admission

Candidate should have passed the Higher Secondary Examination conducted by the Board of Higher Secondary Education, Government of Tamil Nadu CBSE Board with Mathematics as one of the subjects in Higher Secondary Education.

Duration of the Course

The students shall undergo the prescribed B.Sc(Mathematics) course of study for a period of three academic years (six semesters).

Subject of Study

Part I: Tamil Part II: English Part III: 1. Core Subjects 2. Allied Subjects 3. Electives Part IV : 1. Non Major Electives 2. Skill Based Subjects 3. Environmental Studies 4. Value Education Part V : Extension activities

The scheme of Examination

The components for continuous internal assessment are:

Two tests and their average	15 marks
Seminar /Group discussion	5 marks
Assignment	5 marks
Total	25 marks

Pattern of the questions paper for the continuous Internal Assessment

(For Part I, Part II, Part III, NME & Skilled Paper in Part IV)

The components for continuous internal assessment are:

Part –A		
Six multiple choice questions (answer a	ll)	6 x01= 06 Marks
Part –B		
Two questions ('either or 'type)		2 x 07=14 Marks
Part –C		
One question out of two		1 x 10 =10 Marks
Тс	otal	30 Marks

Pattern of the question paper 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 un	uit.)
Part –B		
Five Paragraph questions ('either or 'type)	5 x 07	= 35 Marks
(One question from each Unit)		
Part –C		
Three Essay questions out of five	3 x 10	=30 Marks
(One question from each Unit)		
Total		75 Marks

The Scheme of Examination (Environmental Studies and Value Education)

Two tests and their average	15 marks
Project Report	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.

Question Paper Pattern

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

Part -A			
(Answer is not less than 150 words)			
(Answer is not less than 150 words)		4 v 05 20 Marta	
Four questions (either or type)		4 x 05=20 Marks	
Part –B			
(Answer is not less than 400 words)			
One question ('either or 'type)		1 x 10=10 Marks	
	Total	30 Marks	
Pattern of the Question Paper (External)	for Environmental	Studies & Value	Education only)
Part –A			
(Answer is not less than 150 word	ls)		
Five questions (either or type)		5 x 06 = 30 Marks	
(One question from each Unit)			
Part –B			
(Answer is not less than 400 wor	ds)		
Three questions out of Five each unit (One question from eac	ch Unit)	3 x 15 = 45 Marks	\$
····· (-····]······ ····	Total	75 Marks	

Minimum Marks for a Pass

40% of the aggregate (Internal +Summative Examinations).No separate pass minimum for the Internal Examinations.27 marks out of 75 is the pass minimum for the Summative Examinations.

PROGRAMME SPECIFIC OUTCOMES

- PSO1: To understand the basic rules of logic, including the role of axioms or assumptions
- **PSO2:** To recognize connections between different branches of mathematics and appreciate the connections between theory and applications.
- **PSO3:** To enable the students to gain knowledge in basic Mathematics.
- PSO4: To provide sufficient knowledge on computer skills through MS office, C, C++ and Java Programming and many innovative and modern subjects in Mathematics.

MANNAR THIRUMALAI NAICKER COLLEGE (AUTONOMOUS) B.Sc (Mathematics) (Those who joined in 2018-2019 and after) Table: 1: Course pattern

Study Component	Ι	Π	III	IV	V	VI	Total	Total	No.of	Total
	Sem	Sem	Sem	Sem	Sem	Sem	Hours	Credit	course	marks
Part – I	6(3)	6(3)	6(3)	6(3)			24	12	4	400
Tamil										
Part –II	6(3)	6(3)	6(3)	6(3)			24	12	4	400
English										
Part –III										
Core subjects	6(4)	6(5)	5(5)	5(5)	5(5)	5(5)	76	69	14	1400
			5(5)	5(5)	5(5)	5(5)				
					6(5)	6(5)				
					6(5)	6(5)				
Allied Subject-I	4(4)	4(3)	4(4)	4(3)			16	14	4	400
Allied Subject-I	2(0)	2(1)	2(0)	2(1)			8	2	2	200
(P)										
Allied Subject-II					6(5)	6(5)	12	10	2	200
Allied Subject -									1	100
II (P)										
Part-IV										
Allied	6(4)	6(4)	4(4)	4(4)			20	16	4	400
Mathematics										
Skill Based	2(2)	2(2)			2(2)	2(2)	12	12	6	600
Subjects	2(2)	2(2)								
Environment	2(2)	2(2)					4	4	2	200
studies / value										
education										
Non Major			2(2)	2(2)			4	4	2	200
Elective										
Part V										
Extension				0(1)			0	1	1	100
Activities										
Total	30	30	30	30	30	30	180	140	42	4200
	(20)	(21)	(22)	(23)	(27)	(27)				

Subject	Subjects	No. of	Hours	Credita	Maximum Marks			
code	Subjects	Courses	/ week	Creans	Int.	Ext	Total	
	Part –I Tamil Subject							
18UTAG11	Tamil –I:	1	6	3	25	75	100	
	தற்கால கவிதையும் உரைநடையும்							
	Part –II English Subject							
18UENG11	Exploring Language Through	1	6	3	25	75	100	
	Literature-I							
	Part –III Core Subject	1	6	1	25	75	100	
18UMTC11	Differential Calculus	1	0	4	23	15	100	
	Part –III Allied Subject							
18UPHA11	Allied Physics –I Mechanics,	1	4	4	25	75	100	
	Properties of Matter and Relativity	-	•		20	10	100	
18UPHAP1	Allied Physics Practical - I	_	2	_	_	_	-	
			_					
	Part –IV Skill Subject	1	2	2	25	75	100	
18UMISII	Numerical Aptitude	_					100	
18UMTS12	Trigonometry	1	2	2	25	75	100	
	Part –IV Mandatory Subject	1	2	2	25	75	100	
18UEVG11	Environmental Studies	*	-	-	23	15	100	
	Total	7	30	21	175	525	700	

SEMESTER -I

Subject and	Subjects	No. of	Hours / week	Credi	Maximum Marks		
Subject code	Subjects	Courses	/ WCCK	ts	Int	Ext	Total
	Part –I Tamil Subject						
18UTAG21	Tamil –II:	1	6	3	25	75	100
	பக்தி இலக்கியமும் நாடகமும்						
	Part –II English Subject						
18UENG21	Exploring Language Through	1	6	3	25	75	100
	Literature-II						
	Part –III Core Subject						
18UMTC21	Theory of Equations and its	1	6	5	25	75	100
	applications						
	Part –III Allied Subject		4	2	25	75	100
18UPHA21	Allied Physics –II	1	4	3	23	15	100
	Thermal Physics and Sound						
18UPHAP1	Allied Physics Practical - I	1	2	1	40	60	100
	Part –IV Skill Subject	1	2	2	25	75	100
18UMTS21	MS Office	1	2	2	25	15	100
18UMTSP1	MS Office Lab	1	2	2	40	60	100
	Part –IV Mandatory Subject	1	2	2	25	75	100
18UVLG21	Value Education	1	2	2	23	15	100
	Total	8	30	21	230	570	800

SEMESTER – II

SEMESTER –III							
Subject	Subjects	No. of	Hours	Credits	Maxin	num Mai	rks
code	Subjects	Courses	/ week	Creans	Int	Ext	Total
18UTAG31	Part –I Tamil காப்பிய இலக்கியமும் சிறுகதையும்	1	6	3	25	75	100
18UENG31	Part –II English Exploring Language Through Literature-III	1	6	3	25	75	100
18UMTC31 18UMTC32	Part –III Core Subject Integral Calculus Sequences and Series	1 1	5 5	5 5	25 25	75 75	100 100
18UPHA31 18UPHAP2	Part –III Allied Subject Allied Physics –III Electricity and Electronics Allied Physics Practical - II	1	4 2	4	25	75	100
18UMTN31	Part –IV NME Mathematics for Competitive Examination - I	1	2	2	25	75	100
	Total	6	30	22	150	450	600

SEMESTER IV

Subject		No of	Uours		Maximum Marks		
Code	Title of the Paper	Courses	/Week	Credits	Int	Ex t	Total
18UTAG41	Part – I Tamil பழந்தமிழ் இலக்கியமும் புதினமும்	1	6	3	25	75	100
	Part –II English						
18UENG41	Exploring Language Through Literature-IV	1	6	3	25	75	100
	Part –III Core Subject						
18UMTC41	Analytical geometry 3D and	1	5	5	25	75	100
	Vector calculus						
18UMTC42	Statistics - I	1	5	5	25	75	100
	Part –III Allied Subject						
18UPHA41	Allied Physics- IV	1	4	3	25	75	100
	Optics, Spectroscopy and Modern						
	Physics						
18UPHAP2	Allied Physics Practical -II	1	2	1	40	60	100
	Part –IV Non Major Elective						
18UMTN41	Mathematics for Competitive	1	2	2	25	75	100
	Examination - II						
18UEAG40-	Part V- Extension Activities	1		1	100		100
18UEAG49		1	-	1	100	-	100
	Total	8	30	23	290	51 0	800

SEMESTER -- V

Course	Nome of the source	No. of	Hours /	Credit	Max	imum	Marks
code	Name of the course	Courses	week	S	Int	Ext	Total
	Part –III Core Subject						
18UMTC51	Real Analysis	1	5	5	25	75	100
18UMTC52	Modern Algebra	1	6	5	25	75	100
18UMTC53	Statistics II	1	6	5	25	75	100
18UMTA51	Programming in C	1	5	5	25	75	100
18UMTE51	Differential Equations	1	6	5	25	75	100
18UMTE52	Fuzzy sets						
18UMTE53	Astronomy						
18UMTS51	Part IV Skill Subject Laplace Transforms & Fourier Series	1	2	2	25	75	100

Volume II – Science Syllabus /	2018 - 2019
--------------------------------	-------------

Total 6 30 27 150 450 600							
10tai 0 50 27 150 450 000	Total	6	30	27	150	450	600

SEMESTER --VI

Course code	Name of the subject	No. of	Hours /	Crodite	Maximum Marks			
Course coue		Courses	week	Creuns	Int	Ext	Total	
	Part –III Core Subject							
18UMTC61	Complex Analysis	1	5	5	25	75	100	
18UMTC62	Linear Algebra	1	6	5	25	75	100	
18UMTPR1	Project & Viva-voce	1	6	5	40	60	100	
18UMTA61	Operations Research	1	5	5	25	75	100	
18UMTE61	Graph Theory							
18UMTE62	Stochastic Process	1	6	5	25	75	100	
18UMTE63	Number Theory							
18UMTS61	Part IVSkill Subject	1	2	2	25	75	100	
	Programming in C++	1	2	2	23	15	100	
	Total	6	30	27	165	435	600	



Class	:	B.Sc (Mathematics)	Part III	:	Core
Semester	:	Ι	Hours	:	06
Sub code	:	18UMTC11	Credits	:	04

DIFFERENTIAL CALCULUS

Course Outcomes

- **CO1**. To develop problem solving skills
- CO2. To familiarize the applications of differential calculus.
- **CO3.** To explain about the nature and types of differential calculus.
- **CO4.** To provides the capability of solving the Mathematical problems on skill development.

Unit -I:

Successive differentiation - nth derivative – Standard results – Trigonometrical transformation – Formation of equations involving derivatives – Leibnitz formula.

Unit - II:

Maxima and Minima of two variables – Lagrange's method of undetermined multipliers - Equations of tangent and normal at any point of the curve.

Unit - III:

Angle of intersection of curves – Sub tangent and Sub Normal - Curvature – Circle, radius and centre of curvatures - Cartesian formula for radius of curvature – The coordinates of the centre of curvature.

Unit - IV:

Envelopes - Evolute and involute – Radius of curvature in Polar co-ordinates- p-r equation – Pedal equation of curves .

Unit -V:

Meaning of the derivative – Geometrical interpretation – Meaning of the sign of the differential coefficient – rate of change of variable.

Text Book:

1. T.K.Manickavashagam Pillai and S.Narayanan, Calculus, Volume I, S.Viswanathan Publishers, Chennai, 1996. Chapter 3, Sections: 1.1,1.2,1.3,1.4, 1.5, 1.6, 2.1 Unit-I _ Unit-II Chapter 8, Sections: 4, 5 _ Chapter 9, Sections : 1.2, 1.3, Unit–III Chapter 9, Section: 1.4, Section 2, _ Chapter 10, Sections : 2.1, 2.2, 2.3, 2.4. Chapter 10, Sections : 1.1,1.2,1.3, 1.4, 2.5, 2.6, 2.7. Unit-IV Unit- V Chapter 4, Sections : 1, 2, 3.

Reference Books:

- 1. S.Arumugam and Isaac, Calculus, New Gamma Publishing House, Palayamkottai, 2008.
- 2. Shanthi Narayan, Differential Calculus, S.Chand & Company Ltd , New Delhi, 1979.

3. George B.Thomas, **Thomas' Calculus**, Maurice D.Weir and Joel Hass, Pearson Education Company, 12thEdition, 2015.



Class : B.Sc.,(Mathematics) Semester : I Subject Code : 18UPHA11 Part III : Allied Hours : 4 Credits : 4

ALLIED PHYSICS– I Mechanics, Properties of Matter and Relativity

Course Outcomes:

CO1: To understand the basics concepts of physics in everyday life.CO2: To differentiate the three states of matter.CO3: To understand all the phenomena are relative in nature.CO4: To develop the skill in the area of properties of Matter.

Unit: I

Basic forces in nature - Central forces - Conservative - Non conservative force - Friction -

Work - Work done by the variation force - Energy - Expression for kinetic energy -

Expression for potential energy – Power – Newton's laws of motion – Collision – elastic

and Inelastic collision.

Unit: II

Kepler's laws of planetary motion- Newton's laws of gravitation – Mass and density of

Earth – Boy's method for G – Compound pendulum - Expression for period - Experiment to

find "g" - Variation of g with latitude, altitude and depth – Artificial Satellites.

Unit: III

Elasticity – Different moduli of Elasticity-Poisson's ratio – Bending of beams – Expression for bending moment – determination of Young's modulus by uniform and non uniform bending – Torsion – expression for couple per unit twist – Work done in twisting – Rigidity modulus by torsion pendulum.

Unit: IV

Viscosity - Derivation of Poiseuille's formula (analytical method) - Poiseuille's method for determining coefficient of viscosity of a liquid – Equation of continuity - Bernoulli's thorem – derivation – Applications of Poiseuille's theorem (Venturimeter and Pitot tube).

Unit: V

Frames of reference – Inertial frames and non- Inertial frames -Galilean transformations – Michelson- Morley experiment – Interpretation of results – Postulates of special theory of Relativity – Lorentz transformation equations – Length contraction – Time dilation – Addition of velocities– Variation mass with velocity – Mass –energy equation

Text Book:

1. R.Murugesan Mechanics, Properties of Matter and Sound, Madurai first edition, June2016. [B.Sc. Ancillary Physics]

Unit – I : Page No 1-9, 11-15 Unit – II : Page No 46 – 58 Unit – III : Page No64 – 77 Unit – IV : Page No 83 – 93

 R. Murugesan Mechanics and Relativity, Properties of matter, practical physics, Madurai, first edition, august 2006 [B.Sc Major Physics]. Unit –V: Page No 17-22, 30-32, 36-46, 48-56 Unit – I : Page No: 109, 90, 91

Reference Books:

1.S.L. Kakani, C.Hemarajani, S.Kakani, Mechanics, III edition ,Viva Books Ltd,New

Delhi,2011.

2.Haliday Resnic, Jearl Walker, **Principles of Physics**, 9th Edition, Wiley India Pvt. Ltd, New Delhi,2012.

3.D.S.Mathur, Mechanics, S.Chand and Co., New Delhi,2008

4.Brijlal and N.Subramanyam, Properties of matter, S.Chand and Co., New Delhi,2004



Class : B.Sc(Mathematics) Semester : I& II Subject Code :18UPHAP1

Part III : Allied Hours : 02 Credits :-

ALLIED PHYSICS PRACTICAL - I

Course Outcomes:

CO1: To create the practical knowledge in basic physics experiments.CO2: To understand the bending of beam, compound pendulum and torsion pendulum.CO3: To understand current conduction in electrical circuits.CO4: To create skill in doing the experiment individually.

LIST OF EXPERIMENTS

Any 14 Experiments:

- 1. Non Uniform bending
- 2. Uniform bending
- 3. Compound Pendulum
- 4. Torsion Pendulum
- 5. Thermal conductivity of Bad conductor
- 6. Melde's String
- 7. Sonometer
- 8. Calibration of low range Voltmeter
- 9. Calibration of Ammeter
- 10. Resistance and resistivity
- 11. Comparison of Capacitances
- 12. Comparison of emf's
- 13. Carey Foster Bridge
- 14. Spectrometer
- 15. Torsion Pendulum
- 16. Co-efficient of Viscosity

- Optic lever

- (Pin & Microscope)
- Determination "g"
- -Determination of M.I
- Lee's disc
- Frequency of tunning fork
- Verification of laws
- Potentiometer
- Potentiometer
- Potentiometer
- Spot Galvanometer method.
- Spot Galvanometer method.
- Resistance & resistivity of a wire.
- Refractive indexof a Prism
- -Determination of Rigidity modulus
- Stoke's method.



Class	: B.Sc (Mathematics)	Part IV	: Skill
Semester	: I	Hours	:02
Sub code	: 18UMTS11	Credits	:02

NUMERICAL APTITUDE

Course Outcomes

CO1: To introduce concepts of Mathematics along with analytical ability.CO2: To develop the computational skills needed.CO3: To improve the ability to face the competitive examinations.CO4. To face the Competitive Examination bravely in future on employability.

Unit -I:

Problems on ages.

Unit -II:

Profit and Loss

Unit - III:

Ratio and proportion.

Unit -IV:

Time and Work.

Unit- V:

Permutations and Combinations.

Text Book:

1. R.S.Aggarwal, **Quantitative Aptitude**, Revised and Enlarged Edition, S.Chand publication, New Delhi, Reprint 2009.

Unit I: Chapter 8 (Examples and Exercise first ten problems) Unit II: Chapter 11 (Examples and Exercise first ten problems) Unit III: Chapter 12 (Examples and Exercise first ten problems) Unit IV: Chapters 15 (Examples and Exercise first ten problems) Unit V: Chapters 30 (Examples and Exercise first ten problems).

Reference Books :

- Abhigit Guha, Quantitative Aptitude, 4th Edition, Tata Mc Graw Hill Publication, New Delhi, 2011.
- 2. U.Mohan Rao, Quanlitative Aptitude, Scitech Publications, Chennai, Reprint 2013.



Class	: B.Sc (Mathematics)	Part IV	: Skill
Semester	: I	Hours	:02
Sub code	:18UMTS12	Credits	:02
	-		

TRIGONOMETRY

Course Outcomes

- **CO1**. To familiarize the trigonometrical function
- **CO2.** To develop the capability of finding standard expansions of Trigonometric function.
- CO3. To introduce the various types of hyperbolic functions and its inverse.
- CO4. To mold the students on skill development.

Unit- I

De Moivre's theorem for rational number.

Unit - II

Expression for Trigonometrical functions - $\sin n\theta$, $\cos n\theta$, $\tan n\theta$.

Unit - III

Expression for $\sin^n\theta$, $\cos^n\theta$ and Expression of $\sin\theta$, $\cos\theta$, $\tan\theta$ in powers of θ .

Unit - IV

Hyperbolic functions

Unit - V

Inverse hyperbolic functions

Text Book:

1.Dr.S.Arumugam, Isaac and Somasundaram, **Trigonometry and Fourier series**, New Gamma Publishing House, Tirunelveli, 1999.

Unit I : Section 1.1 Unit II : Section 1.2 Unit III : Section 1.3 & 1.4 Unit IV : Section 2.1 Unit V : Section 2.2

Reference Books :

- 1. S. Narayanan and T.K. Manicavachagom Pillai, S. Viswanathan, **Trigonometry** (Printers & Publishers) Pvt. Ltd, (1997)
- 2. S.L.Loney, **Plane Trigonometry-Part-I&II**(6thEdition), Arihant Publications, 2016.



Class	: B.Sc (Mathematics)	Part IV	: Mandatory
Semester	: I	Hours	: 02
Sub code	: 18UEVG11	Credits	:02
	ENVIRONMENTA	AL STUDIES	

COURSE O	UTCOMES
CO1:To gain	knowledge on the importance of environmental education and ecosystem.
CO2:To acc	uire knowledge about environmental pollution- sources, effects and control
measu	res of environmental pollution
CO3: To un	derstand the various energy sources, exploitation and need of alternate energy
resour	ces. Disaster management To acquire knowledge with respect to biodiversity, its
threat	s and its conservation and appreciate the concept of interdependence
CO4: To ma	ke the student to understand the various pollution problems control mechanisms.
UNIT I :	Environment and Earth: Environment – Meaning – Definition - Components of
	Environment – Types of Environment. Interference of man with the Environment.
	Need for Environmental Education. Earth – Formation and Evolution of Earth-
	Structure of Earth and its components – Atmosphere, Lithosphere, Hydrosphere
	and Biosphere.
	Natural Resources: Renewable Resources and Non-Renewable Resources.
	Natural Resources and Associated Problems. Use and Exploitation of Forest,
	Water, Mineral, Food, Land and Energy Resources.
UNIT II :	Ecology and Ecosystems: Ecology – Meaning - Definition – Scope – Objectives
	– Subdivisions of Ecology.
	Ecosystem –Concept - Structure - Functions – Energy Flow – Food Chain and
	Food Web – Examples of Ecosystems (Forest, Grassland, Desert, Aquatic).
UNIT III :	Biodiversity: Definition – Biodiversity at Global, National and Local Level.
	Values of Biodiversity – Threats to Biodiversity – Conservation of Biodiversity.
	Biodiversity of India: Biogeographical Distribution – Hotspots of Indian
	Biodiversity – National Biodiversity Conservation Board and Its functions.
	Endangered and Endemic Species of India
UNIT IV :	Pollution Issues: Definition – Causes – Effects and Control Measures of Air,
	Water, Soil, Marine, Noise, Thermal and Nuclear Pollutions.
	Global Issues: Global Warming and Ozone Layer Depletion. Future plans of
	Global Environmental Protection Organisations.
UNIT V :	Sustainable Development: Key aspects of Sustainable Development – Strategies
	for Sustainable Development - Agriculture – Organic farming – Irrigation – Water
	Harvesting – Water Recycling – Cyber Waste and Management.
	Disaster Management: Meaning – Types of Disasters - Flood and Drought –
	Earth quake and Tsunami – Landslides and Avalanches – Cyclones and
	Hurricanes – Preventions and Consequences. Management of Disasters -

Text Book:

Study Material for **Environmental Studies**, Mannar Thirumalai Naicker College, Pasumalai, Madurai – 625 004.

Reference Books:

- 1. Study Material for **Environmental Studies**, Publications Division, Madurai Kamaraj University, Madurai 625 021.
- 2. R.C. Sharma and Gurbir Sangha, **Environmental Studies**, Kalyani Publishers, 1, Mahalakshmi Street, T.Nagar, Chennai 600 017.
- Radha, Environmental Studies for Undergraduate Courses of all Branches of Higher Education, (Based on UGC Syllabus), Prasanna Publishers & Distributors, Old No. 20, Krishnappa Street, (Near Santhosh Mahal), Chepak, Chennai – 600 005.
- 4. S.N.Tripathy and Sunakar Panda, **Fundamentals of Environmental Studies**, Vrinda Publications (P) Ltd. B-5, Ashish Complex, (opp. To Ahicon Public School), MayurVihar, Phase-1, Delhi–110 091.
- 5. G.Rajah, **Environmental Studies** for All UG Courses, (Based on UGC Syllabus), Margham Publications, 24, Rameswaram Road, T.Nagar, Chennai 600 017.



Class	:	B.Sc (Mathematics)	Part III	: Core
Semester	:	II	Hours	: 06
Sub code	:	18UMTC21	Credits	: 05

THEORY OF EQUATIONS AND ITS APPLICATIONS

Course Outcomes

CO1 To familiarize with the theory of equations.

CO2 To introduce the transformation of equations.

CO3 To add the information about trigonometric and hyperbolic functions.

CO4. To develop the basic knowledge of application on mathematics.

Unit - I:

Theory of equations – Imaginary roots - Rational roots – Relation between the roots and coefficients – Symmetric functions of the roots.

Unit - II:

Sum of the power of the roots of an equation – Newton's theorem – Transformations of equations – Roots Multiplied by a given number.

Unit - III:

Reciprocal roots – Reciprocal equations- standard forms to increase and decrease the roots of a given equations by a given quantity.

Unit - IV:

Removal of terms – Descarte's rule of sign – Roll's theorem (only statement) – Multiple roots- Strum's theorem (only problems) – General solution of cubic equations – Cardon's method.

Unit - V:

Approximate solutions of Numerical equations- Newton's method – Horner's method.

Text book:

1. S. Arumugam and Isaac, **Classical Algebra and Theory of Equations**, New Gamma Publishing House, Palayamkottai, 2016.

Unit I: Page No: 08 - 31Unit II: Page No: 32 - 41 & 56 - 60Unit III: Page No: 42 - 56 & 60 - 74Unit IV: Page No: 74 - 100Unit V: Page No: 103 - 112

Reference books:

1. T.K. ManicavasagamPillai and S.Narayanan, Algebra – Volume I, S.Viswanathan Printers Publishers Pvt. Ltd, Chennai, 2007.



Class : B.Sc.,(Mathematics) Semester : II Subject Code : 18UPHA21 Part III : Allied Hours : 4 Credits : 3

ALLIED PHYSICS- II Thermal Physics and Sound

CourseOutcomes:

CO1: To create the knowledge in heat conduction.CO2: To understand the thermal physics concepts.CO3: To understand production and propagation of sound.CO4: To develop the skill in the area of Thermal Physics and Sound.

Unit – I:

Radiation – Stefan's law – Determination of Stefan's constant by filament heating method – Solar constant – Water flow Pyroheliometer – Temperature of the sun – Solar spectrum – Energy distribution in black body spectrum – Planck's law(no derivation).

Unit – II:

Kinetic theory of gases – Mean free path – Transport phenomena – Expression for the coefficient of Diffusion, viscocity and thermal conductivity – Degree of freedom – Boltzman's law of equipartition of energy – calculation of Υ for mono atomic and diatomic gases.

Unit – III:

Thermodynamics – Zeroth law (statement only) - First, second and third laws of thermodynamics (statement only) – Entropy – change of entropy in Carnot's cycle – Change of entropy in conversion of ice into stream – Joule Kelvin effect – super conductivity.

Unit – IV:

Simple harmonic motion – Composition of two S.H.M's in a straight line - Composition of two S.H.M's of equal time periods at right angles – stationary waves – Properties of stationary waves – Melde's experiment for the frequency of electrically maintained tuning fork (transverse and longitudinal modes).

Unit – V:

Acoustics of buildings – Requirements of good auditorium – Ultrasonics – Production – piezo electric method – Detection – Kundt's tube and piezo electric properties and application – Determination of velocity of ultrasonic waves in a liquid (ultrasonic diffracton).

Text Books:

- R. Murugesan, Thermal Physics, Chennai, First Edition, June 2012. [B.Sc., Ancillary Physics] Unit – I: 5.1 – 5.10. Unit – II: 6.1 – 6.7, 6.9 – 6.11. Unit – III: 7.5 – 7.7, 8.1, 8.5.
- R. Murugesan, Mechnics, Properties of Matter and Sound, Thermal Physics, Practical I, Chennai, First Edition, July, 2016. Unit – IV: 6.1- 6.3,6.7 – 6.9. Unit – V: 6.11 - 6.12.

Reference Books:

- 1. Brijlal and N. Subramanyam, **Heat and Thermodynamics**, S.Chand and Co, New Delhi, 2004.
- 2. Ubald Raj and Jose Robin, Ancillary physics, Vol.II, Indra Publications, Bhopal, 2002.
- 3. D.Halidary, Resnick and J.Walker, **Fundamental of Physics**, 6th Edition, New Delhi, 2012.
- 4. R. Murugesan, Heat and Thermodynamics, S. Chand and Co, New Delhi, 2004.
- 5. Brijlal and N.Subramanyam, **A text book of Sound**, II Revised Edition, Vikas publishing Pvt. Ltd, New Delhi, 1995.



Class : B.Sc(Mathematics) Semester : I& II Subject Code : 18UPHAP1

Part III : Allied Hours : 02 Credits : 01

ALLIED PHYSICS PRACTICAL – I

Course Outcomes:

CO1: To create the practical knowledge in basic physics experiments. CO2: To understand the bending of beam, compound pendulum and torsion pendulum. CO3: To understand current conduction in electrical circuits. CO4:To create skill in doing the experiment individually.

LIST OF EXPERIMENTS

Any 14 Experiments:

- 1. Non Uniform bending
- 2. Uniform bending
- 3. Compound Pendulum
- 4. Torsion Pendulum
- 5. Thermal conductivity of Bad conductor
- 6. Melde's String
- 7. Sonometer
- 8. Calibration of low range Voltmeter
- 9. Calibration of Ammeter
- 10. Resistance and resistivity
- 11. Comparison of Capacitances
- 12. Comparison of emf's
- 13. Carey Foster Bridge
- 14. Spectrometer
- 15. Torsion Pendulum
- 16. Co-efficient of Viscosity

- Optic lever
- (Pin & Microscope)
- Determination "g"
- -Determination of M.I
- Lee's disc
- Frequency of tunning fork
- Verification of laws
- Potentiometer
- Potentiometer
- Potentiometer
- Spot Galvanometer method.
- Spot Galvanometer method.
- Resistance & resistivity of a wire.
- Refractive indexof a Prism
- -Determination of Rigidity modulus
- Stoke's method.



Class	:	B.Sc (Mathematics)	Part IV	:	Skill
Semester	:	II	Hours	:	02
Sub code	:	18UMTS21	Credits	:	02

MS OFFICE

Course Outcomes

CO1 To introduce the basic concepts.

CO2 To improve the capability on DTP process.

CO3 To encourage the mail merge and sorting process.

CO4Toprovides basic knowledge of computer for employability.

Unit - I:

MS-Word Introduction- Creating and Saving a Document – PageSetup-Printpreview, Print, Edit-Redo, Cut, Copy, Paste, Find and Replace, Views-Normal, Print layout, Ruler, Header and Footer, Insert-Page number, Picture, Text Box, Word art.

Unit - II:

Format Menu (size, color, type),Bulleted numbering, Border and Shading, Columns and Change cases, Tools-Spelling and Grammar-Mail merge, Insert Table, Delete, Select, Split Columns and Rows and draw.

Unit - III:

Explanation of Excel page(Rows, Columns and Cells) -Entering Data, Usage of Formulae and Functions.

Unit -IV:

Creating an Excel Chart, Data Manipulation and Types of Functions.

Unit - V:

Creating a design template – Saving presentation – Existing Powerpoint – View, Insert, and Edit in presentation.

Text book:

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

Unit I - Chapter 1 : Pages 5 - 43
Unit II - Chapter 2 : Pages 50 - 93
Unit III - Chapter 3 : Pages 105 -120 ,125 -135
Unit IV - Chapter 4 : Pages 152 -173
Unit V - Chapter 5 : Pages 177 - 196

Reference Books:

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



Class	: B.Sc (Mathematics)	Part IV	: Skill
Semester	: II	Hours	:02
Sub code	: 18UMTSP1	Credits	: 02

MS OFFICE LAB

Course Outcomes

CO1 To introduce the basic concepts.

CO2 To improve the capability on DTP process.

CO3 To encourage the mail merge and sorting process.

CO4 Toprovides basic knowledge of computer for employability.

List of Programs

- 1. Design a document with at least two pages using MS word with different font style, different font sizes, header and footer, with page number.
- 2. Design an invitation with two column break, use word to insert picture, design border and shading.
- 3. Create a main document and database of addresses and merge them using Mail-merge tools.
- 4. Create a daily attendance sheet of a class room for a week with heading, day, period etc.
- 5. Create students mark list for three subjects and to list the result and rank by using string function and logical function.
- 6. Create a yearly budget of a company and create different types of chart for the data.
- 7. Create a slide show using blank presentation with at least 20 slides.
- 8. Present the college details or any publishing work using Auto content wizard.
- 9. Create a Seminar presentation using insert picture and sound.

Text book:

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

Reference Books:

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



Class	: B.Sc (Mathematics)	Part IV	: Mandatory
Semester	: 11	Hours	:02
Sub code	: 18UVLG21	Credits	:02

VALUE EDUCATION

COURSE	οι	JTCOMES
CO1:Clarif	Yii	ng the meaning and concept of value - value education.
CO2:To in: ofhu	spi 1m	re students to develop their personality and social values based on the principles an values .
CO3: Deve leve	eloj els.	ping sense of Love, Peace and Brotherhood at Local, national and international
CO4:To ena syst	abl em	e the students to understand the social realities and to inculcate an essential value towards building a health society
UNIT I	:	Values and The Individual: Values – Meaning – Definition – Importance – Classification of Values, Value Education – Meaning – Need for Value Education. Values and the Individual – Self-Discipline – Meaning – Tips to Improve Self-Discipline. Self-Confidence – Meaning - Tips to Improve Self- Confidence. Empathy – Meaning – Role of Empathy in motivating Values. Compassion – Role of Compassion in motivating Values. Forgiveness – Meaning - Role of Forgiveness in motivating Values. Honesty – Meaning – Role of Honesty in motivating Values. Courage – Meaning – Role of Courage in motivating Values.
UNIT II	•	Religions and Communal Harmony: Religions – Meaning – Major Religions in India - Hinduism – Values in Hinduism. Christianity – Values in Christianity. Islam – Values in Islam. Buddhism – Values in Buddhism. Jainism – Values in Jainism. Sikhism – Values in Sikhism. Need for Religious Harmony in India. Caste System in India – Need for Communal Harmony in India. Social Justice – Meaning – Factors Responsible for Social Justice.
UNIT III	:	Society and Social Issues: Society – Meaning – Values in Indian Society. Democracy – Meaning – Values in Indian Democracy. Secularism – Meaning – Values in Indian Secularism. Socialism – meaning – Values in Socialism. Social Issues – Alcoholism – Drugs – Poverty – Unemployment.

UNIT IV	:	Human Rights and Marginalised People: Human Rights – Meaning – Problem of Violation of Human Rights in India – Authorities available under the Protection of Human Rights Act in India. Marginalised People like Women, Children, Dalits, Minorities, Physically Challenged – Concept – Rights – Challenges. Transgender – Meaning – Issues.
UNIT V	:	Social Institutions in Value Formation: Social Institutions – Meaning – Important Social Institutions. Family – Meaning – Role of Families in Value Formation. Role of Press & Mass Media in Value Formation – Role of Social Activists – Meaning Contribution to Society – Challenges.

Text Book:

Text Module for Value Education, Mannar Thirumalai Naicker College, Pasumalai, Madurai – 625 004

Reference Books:

- 1. Text Module for Value Education, Publications Division, Madurai Kamaraj University, Madurai 625 021.
- 2. N.S.Raghunathan, Value Education, Margham Publications, 24, Rameswaram Road, T.Ngar, Chennai 600 017.
- 3. Dr.P.Saravanan, and P.Andichamy, **Value Education**, Merit India Publications, (Educational Publishers), 5, Pudumandapam, Madurai-625001.