MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI

UG COURSES – AFFILIATED COLLEGES

B.Sc. Mathematics

(Choice Based Credit System)

(with effect from the academic year 2020-2021 onwards)

Sem	Part	Sub. No.	Subject Status	Subject title	Hrs/ Week	Cre-dits	Marks				
							Maximum			Passing minimum	
							Int.	Ext.	Tot.	Ext.	Tot.
I	I	1	Language	Tamil/Other Languages	6	4	25	75	100	30	40
	II	2	Language	Communicative English	6	4	25	75	100	30	40
	III	3	Core -1	Calculus and Classical Algebra	6	4	25	75	100	30	40
		4	Add on major (Mandatory)	Professional English for Physical sciences -I	4	4	25	75	100	30	40
		5	Allied-I (For Maths Students)	Statistics-I OR Physics With Practicals/ Chemistry With Practicals/ Computer Science	6 6	3 4	25 25	75 75	100 100	30 30	40 40
			Allied-I (For Science Students)	Algebra and Differential Equations	6	4	25	75	100	30	40
	IV	6	Common	Environmental Studies	2	2	25	75	100	30	40
II	I	7	Language	Tamil/Other Languages	6	4	25	75	100	30	40
	II	8	Language	English	6	4	25	75	100	30	40
	III	9	Core-2	Differential Equations and Analytical Geometry of Three Dimensions	6	4	25	75	100	30	40
		10	Add on major (Mandatory)	Professional English for physical sciences II	4	4	25	75	100	30	40
		11	Allied-II (For Maths Students)	Statistics -II OR Physics With Practicals/ Chemistry With Practicals /Computer Science	6 6	3 4	25 25	75 75	100 100	30 30	40 40
			Allied – II (For Science Students)	Vector Calculus & Fourier Series	6	4	25	75	100	30	40
	IV	12	Common	Value Based Education	2	2	25	75	100	30	40

CALCULUS &CIASSICAL ALGEBRA(90 Hours)

Unit I: Curvature, Radius of Curvature and Centre of curvature in Cartesian and polar Co- ordinates- Pedalequation–Involute andEvolute

UnitII Double and Triple Integrals - Changing the orderof integration - Jacobians and change ofvariables

UnitIII Beta and Gamma functions – Application of Beta and Gamma Functions in evaluation of Double and Triple Integrals.

UnitIV Theory of Equations – Formation of equations – Relation between roots and coefficients – symmetric function of the roots. Sum of the powers of the roots of an equation – Newton's theorem

Unit V Reciprocal equation-Transformation of equations- Descarte's rule ofsigns

Text Book:

- Narayanan S and T.K. Manickavasagam Pillai –Calculus Volume I (2004), Volume II (2004), S. Viswanathan PrinterPvt.Ltd.
- Manickavasagam Pillai .T.K and S. Narayanan - Algebra – Viswanathan Publishers and Printers Pvt. Ltd., -2004

Books for Reference :

- Kandasamy P and K. Thilagavathi - Mathematics for B.Sc., Volume II – 2004, S. Chand & Co., NewDelhi.
- Apostaol T.M. - Calculus, Vol. I (4^{th} edition) JohnWiley and Sons, Inc., Newyork1991.
- Apostaol T.M. - Calculus, Vol. II (2^{nd} edition) JohnWiley and Sons, Inc., New York1969)
- Stewart, J - Single Variable Calculus (4^{th} edition) Brooks / Cole, Cengage Learning2010.
- Kandasamy P and K. Thilagavathi - Mathematics for B.Sc., - 2004, Volume I and Volume IV, S. Chand & Co., New Delhi.
- Arumugam .S, Thangapandi Issac – Classical Algebra,New Gamma Publishing

House,Palayamkottai.

- Burnside, W.S. and A.W. Panton - The Theory ofEquations, Dublin University Press, 1954.
- MacDuffee, C.C. - Theory of Equations, John Wiley & SonsInc., 1954.

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SEMESTER – I/III

Statistics
For Mathematics Students) Paper – I (90 Hours)

Objectives:

-To study the concept of measures of dispersion and measures of central tendencies
-To develope the concept Probability distributions

UnitI Moments, Skewness and Kurtosis - Curve fitting - method of least squares – Fitting lines – Parabolic, Exponential andLogarithmiccurves. **16L**

UnitII Correlation and Regression – Scatter Diagram – Karl Pearson‟s coefficient of correlation – Properties – Lines of Regression – Coefficient of Regression and properties –RankCorrelation. **16L**

UnitIII Association of Attributes – Consistency of data – criteria for independence – Yule‟s coefficientofAssociation. **14L**

UnitIV Random variable – Distribution function – properties of Distribution function – Mathematical Expectation – Addition theorem of Expectation – Multiplication theorem of Expectation – Moment generating function – cumulants – characteristic function – Properties ofcharacteristicfunction**.** **22L**

UnitV Discrete and continuous Probability Distributions - Binomial and Poisson Distribution and their moments, Generating function, characteristic function, properties and simple applications. Normal Distribution – Standard normal distribution and their properties – simpleproblems**.** **22L**

Text Book:

Gupta .S.C and V.K. Kapoor – Fundamentals of Mathematical Statistics – (2002) Sultan Chand & Sons, New Delhi.

Books for Reference :

- Vittal, V.R. – Mathematical Statistics (2004) MaragathamPublications
- D.C. Sancheti & Kapoor –Statistics
- M.L. Khanna –Statistics
- S. Arumugam & others –Statistics

Allied Mathematics (Semester I/III)

(For Science Students) Paper – I

Algebra and Differential Equations (90 Hours)

UNITI	Theory of Equations – Formation of Equations – Relation betweenrootsand coefficients – Reciprocalequations.
UNITII	Transformation of Equations – Approximate solutions to equations – Newton's method and Horner'smethod.
UNITIII	Matrices – Characteristic equation of a matrix – Eigen values and Eigen vectors – Cayley Hamilton theorem and simple problems
UNITIV	Differential equation of first order but of higher degree – Equations solvable for p, x, y – Partial differential equations – formations – solutions – Standard form Pp + Qq =R.
UNITV	Laplace transformation – Inverse Laplacetransform.

Text Book:

- Dr. S. Arumugam & others – Allied Mathematics –I

MSU/ 2020-21/UG-Colleges /Part-III (B.Sc. Mathematics) / Semester–II /Core 2

DIFFERENTIAL EQUATIONS & ANALYTICAL GEOMETRY OF THREE DIMENSIONS

(90 Hours)

Unit I First order higher degree equations – solvable for x,y,p and Clairaut's form – Simultaneous differential equations ofthe form $f_1(D)x+ g_1(D)y = h_1(t), f_2(D)x+ g_2(D)y = h_2(t)$

UnitII **(Ordinary differential equation)**
Second order linear differential equations with constant coefficients – Find the P.I for functions of the form $e^{ax}f(x)$ and $x^n f(x)$- Linear equations of second order with variable coefficients

Unit III Analytical Geometry of 3D Co-ordinate system, direction cosines, direction ratios- Equation of plane in different forms - angle between planes- Length ofperpendicular-angle bisection.

UnitIV Equation of a line in different forms - image of a point – imageofaline-Theplaneandthestraightline-anglebetween plane and line-Coplanar lines-Shortest distance between two lines

Unit V Sphere – Tangent plane – circle of intersections – Tangency of Spheres – OrthogonalSpheres.

Text Book:

- Narayanan .S and T.K. Manickavachagam Pillai – Differential equationsand its applications, 2003 - S. ViswanathanPrinters.

- T.K.Manicavachagom Pillay and T.Natarajan-A text book ofAnalytical Geometry - Part-II Three Dimensions-S.Viswanathan(Printers&Publishers)PvtLtd(2012)

Books for Reference :

- Kandasamy .P and K. Thilagavathi - Mathematics for B.Sc., Vol.III – 2004 – S.Chand and Co., New Delhi.
- Braun .M. - Differential Equations and their applications(III edition) Springer – Verlag, New York1983)
- Boyce .W.E and R.C. Diprima – Elementary differentialequations and Boundary value Problems (VII editions) - John Wiley and Sons, Inc, New York2001.
- Sankaranarayan and Manguldoss – DifferentialEquations.
- Duraipandian .P. Laxmi Duraipandian and D.Muhilan - Analytical Geometry of Three Dimension - Emerald Publishers.
- Kandasamy .P. and K. Thilagavathi – Mathematics for B.Sc., Vol. IV – 2004 S.Chand and Co. NewDelhi.
- Loney .S.L. - The Elements of Coordinate Geometry - Mcmillanand CompanyLondon.
- B. StephenJohn- Analytical Geometry of 3D and vector differentiation : IDEALpublication.

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SEMESTER – II / IV

Statistics

(For Mathematics Students) Paper – II (90Hours)

Objectives:

-To know the concept of index numbers
-To study the distribution functions
-To understand the Analysis of varience

UnitI Characteristics of index numbers – Laspeyer‟s and Paasche‟s – Fisher‟s and Bowley‟s Marshall and Edgeworth‟s index numbers – Tests – Unit test, CommodityReversaltest,TimeReversaltest,circulartest**.** **12L**

UnitII Testing of Hypothesis – Null hypothesis and Alternate hypothesis – Type I and Type II errors - Critical Region, Level of significance – Test of significance for large samples – Testing a single proportion – Difference of proportions. Testing a single mean and Differenceofmeans.
18L

UnitIII Tests based on t-distribution – single mean and Difference of means – Tests based on F-distribution – Variance Ratio test – Tests based on Chi-square Distribution – Independence – Goodnessoffit**.**
16L

UnitIV Analysis of varience – one way and two way classified data – Basis of experimental design – Randomized Block Design – Latin square – simple problems.
22L

UnitV Statistical Quality control – Definition – Advantages, Process control – Control chart, Mean chart, Range chart, P-chart, Product Control – Sampling Inspection Plans .
22L

Text Book:

- Gupta .S.C & V.K. Kapoor – Fundamentals of Mathematical Statistics – (2002) Sultan Chand & Sons, NewDelhi.

Books for Reference :

- Vittal .P.R – Mathematical Statistic (2004) – MaragathamPublications
- DC Sancheti & Kapoor –Statistics
- M.L. Khanna –Statistics
- S. Arumugam & others –Statistics

Allied Mathematics (Semester II/IV)
(For Science Students) Paper – II
Vector Calculus & Fourier Series (90 Hours)

UNITI Vector differentiation – Gradient – Divergence andcurl.

UNITII Evaluation of double and triple integrals.

UNITIII Vector integration – Line, surface and volumeintegrals.

UNITIV Green's, Stokes and Divergence theorems (without proof) – simple problems.

UNITV Fourier series – Even and odd functions – Half range Fourierseries.

Text Books:

- Dr. S. Arumugam & others – Vector Calculus
- T.K. Manicavachagom Pillai – Calculus (Vol II)