MANONMANIAM SUNDARANAR UNIVERSITY -TIRUNELVELI

UG **PROGRAMMES**

OPEN AND DISTANCE LEARNING (ODL) PROGRAMMES

(FOR THOSE WHO JOINED THE PROGRAMMES FROM THE ACADEMIC YEAR 2023-2024 ONWARDS)

B.Sc. Mathematics			
Semester	**Course**	**Title of the Course**	**Course Code**
III	Part I –Languages (Tamil)	தமிழக வரலாறும் பண்பாடும்	J1TL31
	Part II – Languages (English)	General English III	J2EN31
	Core V	Vector Calculus and Applications	JMMA31
	Core VI	Differential Equations and Applications	JMMA32
	Elective III	Statistics I	JEMA31
	Skill Enhancement Course - IV	Computational Mathematics	JSMA31
	NMC /Substitute Paper	Mathematics for Competitive Examination III	JNMA31
	EVS	Environmental Studies (Common)	JEVS31

Vector Calculus and Applications

Unit	Details
I	Vector point function - Scalar point function - Derivative of a vector and derivative of a sum of vectors - Derivative of a product of a scalar and a vector point function - Derivative of a scalar product and vector product. (Chapter 1:Sections -1.1to1.5)
II	The vector operator „del", The gradient of a scalar point Function - Divergence of a vector - Curl of a vector - solenoidal and irrotational vectors – simple applications.(Chapter 2:Sections -2.1to2.7)
III	Laplacian operator,Vectoridentities-Lineintegral- simple problems.(Chapter 2:Section -2.8and Chapter3:Sections - 3.1 to 3.4)
IV	Surface integral-Volume integral – Applications. (Chapter 3:Sections - 3.5,3.6)
V	Gauss Divergence Theorem, Stoke"s Theorem, Green"s Theorem in two dimensions – Applications to real life situations.(Chapter 4:Sections - 4.1to4.5)

Recommended Text
P. Duraipandian and Laxmi Duraipandian, Vector Analysis,Emerald Publishers, 2005.

Differential Equations and Applications

Unit	Details
I	Ordinary Differential Equations: Variable separable – Homogeneous Equation– Non-Homogeneous Equations of first degree in two variables – LinearEquation – Bernoulli"s Equation– Exact differential equations. (Chapter 2:Sections - 1to6)
II	Equation of first order but of higher degree: Equation solvable for dy/dx - Equation solvable for y–Equation solvable for x– Clairaut"s form– Linear Equations with constant coefficients: Definition – The operator D – Complete solution – Particular integrals of algebraic, exponential, trigonometric functions and their products. (Chapter 4:Sections -1 to 3andChapter 5: Sections - 1to4)
III	Linear equations of second order: Complete solution in terms of a known integral – Reduction to normal form – Change of independent variable - Applications of first order equations: Flow of water from an orifice – Falling bodies and other rate problems, Free fall under Gravity – The Brachistochrone – Fermat and Bernoulli – Simple electric circuits. (Chapter 8: Sections - 1 to 3 & Chapter 3: Sections - 2 to 6)
IV	Partial differential equation: Formation of PDE by Eliminating arbitrary constants and arbitrary functions–Complete integral– Singular integral – General integral – Lagrange"s Linear Equations.(Chapter 12: Sections - 1 to 4)
V	Special methods–Standard forms.(Chapter 12: Sections-5.1 to 5.5)

Recommended Text
S. NarayananandT . K . ManicavachagomPillay, Differential equations and its application S. Viswananthan Printers Pvt. Ltd. 2012

Statistics I

Unit	Details
I	Dispersion – Measures of Dispersion – Coefficients of Dispersion – Moments – Skewness – Kurtosis. (Book 1 - Chapter 2: Sections - 2.12 to 2.17)
II	Correlation – Scatter Diagram – Karl Pearson‟s coefficient of correlation – Probable error of Correlation Coefficient – Rank Correlation. (Book 1 - Chapter 10: Sections - 10.2 to 10.4, 10.6, 10.7)
III	Curve Fitting and Regression: Linear Regression – Curve linear Regression – Regression Curve. (Book 1 - Chapter 11: Sections - 11.2 to 11.4)
IV	Theory of Attributes: Notations and Terminology – Classes and Class Frequency – Consistency of Data – Independence of Attributes – Association of Attributes. (Book 1 - Chapter 13: Sections - 13.2 to 13.6)
V	: Index Numbers – Consumer Price Index Numbers – Conversion of Chain Base Index Number into Fixed Ba conversely. (Book 2 - Chapter 9: Sections - 9.1 to 9.3)

Recommended Text
S. G. Gupta and V. K. Kapoor, Fundamentals of Mathematical Statistics, 12th Edition, Sultan Chand& Sons, New Delhi, 2021.
S. Arumugam and A. Thangapandi Isaac, Statistics, New Gamma Publishing House, 2016.

Computational Mathematics

Unit	Details
I	Algebraic and Transcendental Equations: Errors in Numerical Computation – Iteration method – Regula Falsie method. (Chapter 3: Sections - 3.1, 3.2, 3.4)
II	Algebraic and Transcendental Equations: Bisection method – Newton-Raphson method – Horner‟s method. (Chapter 3: Sections - 3.3, 3.5, 3.6)
III	Simultaneous Equations: Simultaneous equations – Back substitution – Gauss Elimination method – Gauss-Jordan Elimination method – Calculation of inverse of a matrix. (Chapter 4: Sections - 4.1 to 4.5)
IV	Simultaneous equations: Iterative Methods – Gauss Jacobi iteration method – Gauss-Seidel Iteration method – Relaxation method – Newton Raphson method for simultaneous equations. (Chapter 4: Sections - 4.7 to 4.10)
V	Numerical Solutions of Partial Differential Equations: Classification of partial differential equations of second order – Finite Difference Approximations to Derivatives – Laplace equation – Poisson‟s equation. (Chapter 11: Sections - 11.0 to 11.4)

Recommended Text
S. Arumugam, A. Thangapandi Isaac and A. Somasundaram, Numerical Methods, Scitech, 2017.

Mathematics for Competitive Examination III

Unit	Details
I	Square root and cube root.
II	Trains.
III	Problems on age.
IV	Area.
V	Volume & Surface area.

Recommended Text
R.S. Agarwal -ObjectiveArithmetic, Published byS. Chand& Co, Ltd., Edition, 2018.