MANONMANIAM SUNDARANAR UNIVERSITY -TIRUNELVELI

UG **PROGRAMMES**

OPEN AND DISTANCE LEARNING(ODL) PROGRAMMES

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

B.Sc. Mathematics

Semester	Course	Title of the Course	Course Code
II	Part I – Languages (Tamil)	தமிழ் இலக்கிய வரலாறு - II	J1TL21
	Part II – Languages (English)	General English – II	J2EN21
	Core – III	Analytical Geometry (Two & Three Dimensions)	JMMA21
	Core - IV	Integral Calculus	JMMA22
	Elective - II	Allied Physics - II	JEPH21
		Allied Physics Practical - II	JEPHP2
	Skill Enhancement Course – II	Mathematics for Competitive Examination - II	JSMA21
	Skill Enhancement Course – III	LaTeX	JSMA22

ANALYTICAL GEOMETRY (Two & Three Dimensions)

UNIT	DETAILS
I	Pole, Polar - conjugate points and conjugate lines – diameters – conjugate diameters of an ellipse - semi diameters- conjugate diameters of hyperbola.
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.
III	System of Planes-Length of the perpendicular–Orthogonal projection.
IV	Representation of line–angle between a line and a plane – co – planar lines– shortest distance between two skew lines –length of the perpendicular.
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.
Recommended Text	
1	T.K. Manicavachagam Pillay & T. Natarajan, Analytical geometry (Part-I – Two dimensions), S. Viswanathan (Printers and Publishers) Pvt. Ltd. (2012).
2	1. T.K. Manicavachagam Pillay & T. Natarajan, Analytical geometry (Part-II – Three dimensions), S. Viswanathan (Printersand Publishers) Pvt. Ltd. (2012).
3	S. Arumugam and A. Thangapandi Issac, Analytical geometry 3D and Vector Calculus, New Gamma Publishing House, Palayamkottai,2011.

INTEGRAL CALCULUS

UNIT	DETAILS
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.
II	Multiple Integrals - definition of double integrals - evaluation of double integrals – double integrals in polar coordinates - Change of order of integration.
III	Triple integrals –applications of multiple integrals - volumes of solids of revolution - areas of curved surfaces–change of variables - Jacobian.
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 - Applications.
V	Geometric and Physical Applications of Integral calculus.
RecommendedText	
1	S. Narayanaqn, T.K. Manicavachagam Pillay, Calculus Vol II, S.Viswanathan (Printers and Publishers) Pvt. Ltd. (2009).
2	S. Arumugam & A. Thangapandi Issac, Calculus, New Gamma Publishing House, Palayamkottai. (2011).

ALLIED PHYSICS–II

UNIT	DETAILS
I	**OPTICS: i**nterference – 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 – Optical activity – Application in sugar industries
II	**ATOMIC PHYSICS:** Atom models –Bohr atom model–Mass number – Atomic number – Nucleons –Pauli's exclusion principle – electronic configuration – Periodic classification of elements –Zeeman effect (elementary ideas only)– Photo electric effect–Einstein's photo electric equation–Applications of photo electric effect:
III	**NUCLEAR PHYSICS : N**uclear models – Liquid drop model – Magic numbers – Nuclear energy – Mass defect – Binding energy –Radioactivity–Uses–Chain reaction-Controlled and uncontrolled chain reaction – Nuclear fission – Energy released in fission —Nuclear fusion – Differences between fission and fusion.
IV	**INTRODUCTION TO RELATIVITY AND GRAVITATIONAL WAVES**: Frame of reference – Postulates of special theory of relativity - Lorentz transformation equations – Derivation – Length contraction – Time dilation – Mass-energy equivalence.
V	**SEMICONDUCTOR PHYSICS:** p-n junction diode – Forward and reverse biasing – Characteristic of diode – Zener diode – characteristic of zener diode – Voltage regulator construction and working – Advantages (no mathematical treatment) – USB cell phone charger– Introduction to e-vehicles and EV charging stations.
VI	**PROFESSIONAL COMPONENTS:** Expert lectures–Seminars– – Webinars – Industry inputs – Social accountability –Patriotism

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

ALLIED PHYSICS PRACTICAL–II

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. Wave length 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 meritable 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 gateasa universal building block

MATHEMATICS FOR COMPETETIVE EXAMINATION II

UNIT	DETAILS
I	Simple interest and Compound interest.
II	Time and work.
III	Time and Distance.
IV	Chain Rule.
V	Pipes and Cistern
Recommended Text	
1	R.S. Agarwal- Objective Arithmetic, Published by S. Chand & CoLtd., Edition (2018).

LaTeX

UNIT	DETAILS
I	Typing text: Words, sentences and paragraphs- symbols not on the keyboard-comments and footnotes- Changing font Characteristics-Lines, paragraphs and pages-spaces- Boxes.
II	Text environments: some general rules for displayed text environments - List of environments-style and size environments-proclamations(theorem-like structures) - Proof environments-Tabular environments-Tabbing environments-Miscellaneous displayed text environments.
III	Typing math: Math environments -spacing rules- equations--spacing rules - equations-Basic constructs- Arithmetic operations-Delimiters-Operators-Math accents- Stretchable horizontal lines-formula gallery.
IV	More math: Spacing of symbols building new symbols-math alphabets and symbols-vertical spacing-Tagging and grouping-Generalized fractions-Boxed formulas.
V	Latex documents: The structure of a document-The preamble-Abstract-Sectioning-Cross referencing- Bibliographies.
Recommended Text	
1	George Gratzer,More Math into LaTeX,4th edition,Springer,2007