From

    Mrs.B.K.Jaleesha,
    Assistant Professor,Head of the Department,
    Department of Mathematics,
    St. Joseph's College of Arts & Science for Women,
    Hosur-635126.

To

    The Principal,
    St. Joseph's College of Arts & Science for Women,
    Hosur-635126.

Respected Sister,

Sub: Conducting **Value Added Course** on **CSIR NET & JAM** skill training classes
permission Reg:-

    We would like to request your permission to conduct **Value Added Course** on **CSIR NET & JAM** skill training classes for our department students from 10.03.2021 to 25.07.2021[30 Hrs]. Kindly grant us permission and to provide the needful support for the successful completion.

Thank you,

Yours sincerely,

HOD, DEPARTMENT OF MATHEMATICS
ST.JOSEPH'S COLLEGE OF ARTS &
SCIENCE FOR WOMEN,
SIPCOT, HOSUR- 635 126

PRINCIPAL
ST. JOSEPH'S COLLEGE OF ARTS
& SCIENCE FOR WOMEN
Mookandapalli, Sipcot,
HOSUR - 635 126, Krishnagiri - Dist.

Value-Added courses were conducted by the Department of Mathematics. These courses help enhance student's skills and knowledge in specific areas. They provide advantages such as improved job prospects, academic enrichment. The following courses were taken:

- IIT JAM (Joint Entrance Test for M.Sc.)
- CSIR NET (Council of Scientific & Industrial Research)

IIT Jam classes were conducted for 10students of our department (3 students from II B.Sc. Mathematics and 7 students from III B.Sc. Mathematics).

The classes were taken by Dr. V. Thanga Murugeswari and Dr.S. Rajeswari

CSIR NET classes were conducted for 25 students of our department (4 students from II M.Sc. Mathematics & 21 students from I M.Sc. Mathematics)

The classes were taken by Mrs. B.K. Jaleesha, Mrs. T. Mahalakshmi, Mrs. M. Meenakshi , Mrs. M. Shobana Priya, Mrs. G.J. Jeba selvi kavitha , Mrs.J.JoanPrinciya, Ms. S. Malliga, Mrs . M. Priya, Dr. V. Thanga Murugeswari and Dr.S. Rajeswari

IIT Jam classes were conducted for 10students of our department.(3 students from II B.Sc. Mathematics and 7 students from III B.Sc. Mathematics).The classes were taken by Dr. V. Thanga Murugeswari and Dr.S. Rajeswari

Signature of the HOD:

HOD, DEPARTMENT OF MATHEMATICS
ST. JOSEPH'S COLLEGE OF ARTS &
SCIENCE FOR WOMEN,
SIPCOT, HOSUR-635126

Signature of the Principal:

PRINCIPAL
ST. JOSEPH'S COLLEGE OF ARTS
& SCIENCE FOR WOMEN
Mookandapalli, Sipcot,
HOSUR-635 126, Krishnagiri Dist.

DEPARTMENT OF MATHEMATICS

CSIR NET-SET COACHING CLASS

FROM 10.03.2021 ONWARDS (TWO CLASSES PER WEEK)

TOPICS COVERED

LINEAR ALGEBRA

MATRICES

ABSTRACT ALGEBRA

REAL ANALYSIS

COMPLEX ANALYSIS

ODE AND PDE

CALCULUS OF VARIATION

St. JOSEPH'S COLLEGE OF ARTS AND SCIENCE FOR WOMEN, HOSUR

VALUE ADDED COURSE 2020-2021
CONDUCTED BY MATH METRON ASSOCIATION

DEPARTMENT OF MATHEMATICS
(PG & RESEARCH)

THE DEPARTMENT OF MATHEMATICS IS PLANNED TO CONDUCT VALUE ADDED COURSES:

- CSIR - NET CLASS ONLY FOR PG
- JAM FOR II UG AND III UG

INTERESTED STUDENTS ARE ASKED TO JOIN IN THEIR WILLING COURSE,

DURATION : 30HRS

CLASSES COMMENCEMENT ON : 10.03.2021

St. Joseph's College of Arts and Science for Women, Hosur.
DEPARTMENT OF MATHEMATICS

ADD-ON COURSE

CSIR-NET JRF COACHING

Analysis:
Hours: 6

Elementary set theory, finite, countable and uncountable sets, Real number system as a complete ordered field, Archimedean property, supremum, infimum. Sequences and series, convergence, limsup, liminf. Bolzano Weierstrass theorem, Heine Borel theorem. Continuity, Differentiability, Mean value theorem, Sequences, and series. Functions of several variables, Metric spaces, compactness, connectedness. Normed Linear Spaces.

Linear Algebra:
Hours: 6

Vector spaces, algebra of linear transformations. Algebra of matrices, determinant of matrices, linear equations. Eigenvalues and eigenvectors, Cayley-Hamilton theorem. Matrix representation of linear transformations. Change of basis, canonical forms, diagonal forms, triangular forms, Jordan forms.Quadratic forms, reduction, and classification of quadratic forms

Complex Analysis:
Hours: 6

Algebra of complex numbers, the complex plane, polynomials, power series, transcendental functions such as exponential, trigonometric, and hyperbolic functions. Analytic functions, Cauchy-Riemann equations. Contour integral, Cauchy's theorem, Cauchy's integral formula, Liouville's theorem, Maximum modulus principle, Schwarz lemma, Open mapping theorem. Taylor series, Laurent series, calculus of residues. Conformal mappings, Mobius transformations.

Algebra:
Hours: 6

Permutations, combinations, Fundamental theorem of arithmetic, divisibility in Z, congruences, Chinese Remainder Theorem, Euler's Ø- function, primitive roots, Cayley's theorem, Sylow theorems. Rings, ideals, prime and maximal ideals, quotient rings, unique factorization domain, Polynomial rings, and irreducibility criteria. Fields, finite fields, field extensions, Galois Theory.

Differential Equations
Hours: 6

Existence and uniqueness of solutions of initial value problems for first-order ordinary differential equations, singular solutions of first-order ODEs, the system of first-order ODEs. Lagrange and Charpit methods for solving first order PDEs, Cauchy problem for first-order PDEs. Classification of second-order PDEs, General solution of higher-order PDEs with constant coefficients, Method of separation of variables for Laplace, Heat and Wave equations.

St. Joseph's College of Arts and Science for Women, Hosur.

DEPARTMENT OF MATHEMATICS

ADD-ON COURSE

IIT JAM Syllabus 2021 for Mathematics (MA)

Sequences and Series of Real Numbers: Hours:6

Sequence of real numbers, the convergence of sequences, bounded and monotone sequences, convergence criteria for sequences of real numbers, Cauchy sequences, subsequences, Bolzano-Weierstrass theorem. Series of real numbers, absolute convergence, tests of convergence for series of positive terms – comparison test, ratio test, root test; Leibniz test for convergence of alternating series.

Functions of One orTwo or ThreeReal Variable: Hours:4

Limit, continuity, intermediate value property, differentiation, Rolle's Theorem, mean value theorem, L'Hospital rule, Taylor's theorem, maxima, and minima, partial derivatives, differentiability, maxima, and minima.

Integral Calculus: Hours:4

Integration as the inverse process of differentiation, definite integrals, and their properties, Fundamental theorem of calculus. Double and triple integrals, change of order of integration, calculating surface areas and volumes using double integrals, calculating volumes using triple integrals.

Differential Equations: Hours:4

Ordinary differential equations of the first order of the form $y'=f(x,y)$, Bernoulli's equation, exact differential equations, integrating factor, orthogonal trajectories, homogeneous differential equations, variable separable equations, linear differential equations of second order with constant coefficients, Method of variation of parameters, Cauchy-Euler equation.

Vector Calculus: Hours:2

Scalar and vector fields, gradient, divergence, curl, line integrals, surface integrals, Green, Stokes, and Gauss theorems.

Group Theory: Hours:4

Groups, subgroups, Abelian groups, non-Abelian groups, cyclic groups, permutation groups, normal subgroups, Lagrange's Theorem for finite groups, group homomorphism, and basic concepts of quotient groups.

Linear Algebra: Hours: 6

Finite dimensional vector spaces, linear independence of vectors, basis, dimension, linear transformations, matrix representation, range space, null space, rank-nullity theorem. Rank and inverse of a matrix, determinant, solutions of systems of linear equations, consistency conditions, eigenvalues, and eigenvectors for matrices, Cayley-Hamilton theorem.

Real Analysis: Hours: 6

Interior points, limit points, open sets, closed sets, bounded sets, connected sets, compact sets, completeness of R. Power series (of real variable), Taylor's series, radius and interval of convergence, term-wise differentiation, and integration of power series.