

ISLAMIAH WOMEN'S ARTS AND SCIENCE COLLEGE Permanently Affiliated to Thiruvalluvar University Recognized by UGC under sections 2(f) and 12(B) of the UGC Act 1956 Accredited with "B" Grade by NAAC Approved by the Government of Tamil Nadu Phone:04174-235266 Email: principaliwc@gmail.com www.islamiahwomensartsandsciencecollege.com

DEPARTMENT OF MATHEMATICS WITH COMPUTER APPLICATIONS REGULATION 2023-24 B.SC. (DEPARTMENT OF MATHEMATICS WITH COMPUTER APPLICATIONS)

PROGRAM OUTCOMES (PO's)

PO1: Disciplinary knowledge: Capable of demonstrating comprehensive knowledge and understanding of one or more disciplines that form a part of an undergraduate Programme of study

PO2: Communication Skills: Ability to express thoughts and ideas effectively in writing and orally; Communicate with others using appropriate media; confidently share one's views and express herself/himself; demonstrate the ability to listen carefully, read and write analytically, and present complex information in a clear and concise manner to different groups.

PO3: Critical thinking: Capability to apply analytic thought to a body of knowledge; analyse and evaluate evidence, arguments, claims, beliefs on the basis of empirical evidence; identify relevant assumptions or implications; formulate coherent arguments; critically evaluate practices, policies and theories by following scientific approach to knowledge development.

PO4: Problem solving: Capacity to extrapolate from what one has learned and apply their competencies to solve different kinds of non-familiar problems, rather than replicate curriculum content knowledge; and apply one's learning to real life situations.

PO5: Analytical reasoning: Ability to evaluate the reliability and relevance of evidence; identify logical flaws and holes in the arguments of others; analyze and synthesize data from a variety of sources; draw valid conclusions and support them with evidence and examples, and addressing opposing viewpoints.

PO6: Research-related skills: A sense of inquiry and capability for asking relevant/appropriate questions, problem arising, synthesising and articulating; Ability to recognise cause-and-effect relationships, define problems, formulate hypotheses, test hypotheses, analyse, interpret and draw conclusions from data, establish hypotheses, predict cause-and-effect relationships; ability to plan, execute and report the results of an experiment or investigation

PO7: Cooperation/Team work: Ability to work effectively and respectfully with diverse teams; facilitate cooperative or coordinated effort on the part of a group, and act together as a group or a team in the interests of a common cause and work efficiently as a member of a team

PO8: Scientific reasoning: Ability to analyse, interpret and draw conclusions from quantitative/qualitative data; and critically evaluate ideas, evidence and experiences from an open-minded and reasoned perspective. **PO9: Reflective thinking**: Critical sensibility to lived experiences, with self awareness and reflexivity of both self and society.

PO10 Information/digital literacy: Capability to use ICT in a variety of learning situations, demonstrate ability to access, evaluate, and use a variety of relevant information sources; and use appropriate software for analysis of data.

PO 11 Self-directed learning: Ability to work independently, identify appropriate resources required for a project, and manage a project through to completion.

PO 12 Multicultural competence: Possess knowledge of the values and beliefs of multiple cultures and a global perspective; and capability to effectively engage in a multicultural society and interact respectfully with diverse groups.

PO 13: Moral and ethical awareness/reasoning: Ability to embrace moral/ethical values in conducting one's life, formulate a position/argument about an ethical issue from multiple perspectives, and use ethical practices in all work. Capable of demonstrating the ability to identify ethical issues related to one's work, avoid unethical behaviour such as fabrication, falsification or misrepresentation of data or committing plagiarism, not adhering to intellectual property rights; appreciating environmental and sustainability issues; and adopting objective, unbiased and truthful actions in all aspects of work.

PO 14: Leadership readiness/qualities: Capability for mapping out the tasks of a team or an organization, and setting direction, formulating an inspiring vision, building a team who can help achieve the vision, motivating and inspiring team members to engage with that vision, and using management skills to guide people to the right destination, in a smooth and efficient way.

PO 15: Lifelong learning: Ability to acquire knowledge and skills, including "learning how to learn", that are necessary for participating in learning activities throughout life, through self-paced and self-directed learning aimed at personal development, meeting economic, social and cultural objectives, and adapting to changing trades and demands of work place through knowledge/skill development/reskilling.

Programme Specific Outcomes:

PSO1: Acquire good knowledge and understanding, to solve specific theoretical & applied problems in different area of Mathematics.

PSO2: Identify the application of Mathematics in other discipline and society to solve real life problems.

PSO3: Explore and apply technical knowledge in diverse areas of Computer Applications and Mathematics is conducive in cultivating skills for successful career, entrepreneurship.

COURSE OUTCOME

SEMESTER I

COURSE: ALGEBRA AND TRIGONOMETRY (CORE PAPER) CREDIT:5

CLO 1: Classify and Solve reciprocal equations

CLO 2: Find the sum of binomial, exponential and logarithmic series

CLO 3: Find Eigen values, eigen vectors, verify Cayley – Hamilton theorem and diagonalize a given matrix

CLO 4: Expand the powers and multiples of trigonometric functions in terms of sine and cosine

CLO 5: Determine relationship between circular and hyperbolic functions and the summation of trigonometric series

COURSE: CALCULUS (CORE PAPER)

CREDIT:5

CLO 1: Evaluate the nth derivative using Leibnitz Rule

CLO 2: Compute Radius and circle of curvature, Evolute and Maxima – Minima of two variables.

CLO 3 : Evaluate integral values by appropriate reduction formula.

CLO 4: Identify the multiple integral techniques and Evaluate.

CLO 5: Evaluate the indefinite integrals using the properties of Beta and Gamma functions.

COURSE: WEB DESIGNING WITH HTML (ELECTIVE) CREDIT:3

CLO1:Understand the basic concept in HTML. Concept of resources in HTML

CLO2:Create the Meta Data, Design concept & save the files.

CLO3:Understand page formatting and the concept of list.

CLO4: Creating Links and understand the concept of creating link to email address

CLO5: Create concepts by adding images.Understand the table creation.

COURSE: MATHEMATICS FOR COMPETITIVE EXAMINATIONS-I(ELECTIVE)

CREDIT:2

CLO1: Solve Mathematical Problems using Mathematical formulae.

CLO2: Understand the knowledge of application of Mathematics

CLO3: Understand the concepts of simplification.

CLO4: Calculate the square root and cube root

CLO5: Solve the problems on age.

CLO 1: Prove the binomial theorem and apply it to find the expansions of any $(x + y)^n$ and also, solve the related problems

CLO 2: Find the various sequences and series and solve the problems related to them. Explain the principle of counting.

CLO 3: Find the number of permutations and combinations in different cases. Apply the principle of counting to solve the problems on permutations and combinations

CLO 4: Explain various trigonometric ratios and find them for different angles, including sum of the angles, multiple and submultiple angles, etc. Also, they can solve the problems using the transformations.

CLO 5: Find the limit and derivative of a function at a point, the definite and indefinite integral of a function. Find the points of min/max of a function.

SEMESTER II

COURSE: ANALYTICAL GEOMETRY AND VECTOR ANALYSIS (CORE PAPER) CREDIT:5

CLO 1: Solve problems in the system of Planes

CLO 2: Estimate the angle between the line and plane, coplanar lines and shortest distance between skew lines.

CLO 3: Understand the concept of equation of sphere and its applications.

CLO 4: Calculate Directional Derivative, Divergence and Curl.

CLO 5: Apply Green's theorem, Gauss-Divergence theorem, Stoke's theorem to evaluate Area and Volume

COURSE: DIFFERENTIAL EQUATIONS AND ITS APPLICATIONS (CORE PAPER) CREDIT:5

CLO 1: Determine solutions of homogeneous equations, non-homogeneous equations of degree one in two variables, solve Bernoulli's equations and exact differential equationsCLO 2: Find the solutions of equations of first order but not of higher degree and to Determine particular integrals of algebraic, exponential, trigonometric functions and their products

CLO 3: Find solutions of simultaneous linear differential equations, linear equations of second order and to find solutions using the method of variations of parameters **CLO 4:** Form a PDE by eliminating arbitrary constants and arbitrary functions, find complete, singular and general integrals, to solve Lagrange's equations

CLO 5: Explain standard forms and Solve Differential equations using Charpit's method

COURSE: PROGRAMMING WITH PYTHON (ELECTIVE) CREDIT:3

CLO1: Develop and execute simple Python programs.

CLO2: Write simple Python programs using conditionals and looping for solving problems.

CLO3:Decompose a Python program into functions.

CLO4:Represent compound data using Python lists, tuples, dictionaries etc.

CLO5: Read and write data from/to files in Python programs

COURSE: MATHEMATICS FOR COMPETITIVE EXAMINATIONSII(ELECTIVE)

CREDIT:2

CO1: make critique of quantitative in formation using proportional reasoning

CO2 : Interpret and compare weighted averages, indices, ranking.

CO3 : identify uses and misuses of percentages related to a proper understanding of ne bases.

CO4 : examining and estimating percentages as rates per100.

CO5 : solve for an unknown quantity in proportional situation.