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| **Course Code** | CSU5304 | | | | | | |
| **Level** | 5 | | | | | | |
| **Course Title** | Mathematics for computing | | | | | | |
| **Credit value** | 3 credits | | | | | | |
| **Core/Optional** | Optional | | | | | | |
| **Prerequisites** | (EL/CR in 6 credits from L4 Computer Science courses)  (CSU5304)+(CSU5305) (EL/CR ) and EL/CR in 6 credits from L4 Computer Science courses | | | | | | |
| **Hourly breakdown** | **Theory** | | **Practical**  **hours** | **Independent Learning** | | **Assessments** | **Total hrs.** |
| 25 Sessions X 2 = **50 hrs.** | 4DS x 3 hrs. = **12 hrs.** | **-** | * Sessions (25 x 3)   = 75 hrs.   * Online = 11 hrs.   Total = **86 hrs.** | | * Continuous Assessments (CA) : **02 hrs.** | **150 hrs.** |
| **Course Aim/s.** | Have acquired an open minded and innovative way of thinking.. | | | | | | |
| **PLOs addressed by course** | **PLO1: Knowledge:** Explain the fundamental, principles and broader knowledge pertaining to the chosen science disciplines offered for the degree.  **PLO5: Creativity and Problem Solving:** Identify and analyze problems using quantitative and/or qualitative approaches using scientific methodology to provide valid conclusions.  **PLO8**: **Vision for Life:** Develop the capacity to project for future through identifying self-directed goals and continuously targeting towards them for self-improvement by undertaking further studies.  **PLO9: Lifelong Learning**: Develop the capacity to foresee new trends and their impacts and continuously update knowledge and develop skills willingly to meet those future challenges. | | | | | | |
| **Course Learning Outcomes (CLO)** | At the completion of this course student will be able to;  CLO1: Problem solve through modeling of real world phenomena using mathematics and computing PLO1).  CLO2: Communicate mathematical and computing knowledge (PLO1,5 & 9 ).  CLO3: Assess current technology and future trends in computer science (PLO9).  CLO4: Approach mathematics and computer science research questions from a perspective consistent with the norms of the field (PLO8). | | | | | | |
| **Content**  **(Main topics, sub topics)** | Fundamentals, Logic, Propositional equivalences, Logic proofs, Logic and Bit operations, Introduction to predicate logic, Sets, Proofs and laws of sets, Mathematical reasoning, Functions, Sequences and summations, Writing algorithms, Evaluating algorithms, Number theory, Integers and algorithms, Applications of number theory, Matrices, Induction, Strong induction and well ordering, Recursion and recursive definitions, Program correctness, Counting, Combinatorics, Binomial coefficients and generalized permutations and combinations, Introduction to probability theory | | | | | | |
| **Teaching Learning methods (TL)** | Self-Learning/independent learning of self-study (IL)   * Learning the course contents In course materials in print and web-based materials. * Additional reading materials/ recommended reading (RE)   Contact sessions   * Dayschools (discussion sessions ) (Non- compulsory) | | | | | | |
| **Assessment strategy** | Overall Continuous Assessment Mark (OCAM): 40% | | | | Final Assessment: 60 % | | |
| Details: Continuous Assessment I (CA I) : **01 hr.**  Continuous Assessment II (CA II) : **01 hr.**    OCAM computation:  OCAM= 60% of best CA I/CA II + 40% of other CA I /CA II | | | | Final Evaluation  Theory: **02 hrs.** | | |
| **Recommended**  **Readings:** | 1. Eric Lehman and Thomson Leighton,F. (2009) .*Mathematics for Computer science* (7th Ed). Massachussetts, Institute of Technology. 2. Nievergelt,Y . (2009). *Logic Mathematics and Computer Science* (9thEd) .Prentice Hall. 3. Tenebaum,M. and Pollard,h .*An elementary text book for students of Mathematics ,Engineering and the Sciences*. Dover Publications, New York. 4. Zafer,A. (2005). *Matrices and their Applications*. Prentice Hall 5. Golfand,I.M.and Glagoleva,E.G. (e-text book). *Functions & Graphs* | | | | | | |

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