Department	International College of Liberal Arts		
Semester	Spring 2023	Year Offered (Odd/Even/Every Year)	Every Year
Course Number	QREA101		
Course Title	Math for Liberal Arts		
Prerequisites	None		
Course Instructor	JHINGAN Sanjay	Year Available (Grade Level)	1
Subject Area	Quantitative Reasoning & Natural Sciences	Number of Credits	3
Class Style	Lecture	Class Methods	Face to face

(NOTE 1) Class Methods are subject to change

(NOTE 2) Depending on the class size and the capacity of the facility, we may not be able to accommodate all students who wish to register for the course"

Course Description	This course gives an introduction to the beauty and power of the ideas of mathematics. Topics include: numbers, games, infinity, harmony and symmetry, cryptography, networks, chaos and fractals, finance, voting theory.
Class plan based on course evaluation from previous academic year	Based on student feedback from the previous offering of this course there will be regular in-class quizzes. This will help students understand better their learning and over all progress.
Course related to the instructor's practical experience (Summary of experience)	Not Applicable.
Learning Goals	By the end of the course student should be able to: 1. Appreciate the role of mathematics in Nature, Humanities, and Social sciences. 2. Apply mathematical strategies to solve problems in the world of finance, politics, arts, etc.

iCLA Diploma Policy	DP2

iCLA Diploma Policy

(DP1) To Value Knowledge – Having high oral and written communication skills to be able to both comprehend and transfer knowledge

(DP2) To Be Able to Adapt to a Changing World – Having critical, creative, problem-solving, intercultural skills, global and independent mindset to adopt to a changing world

(DP3) To Believe in Collaboration – Having a disposition to work effectively and inclusively in teams

(DP4) To Act from a Sense of Personal and Social Responsibility – Having good ethical and moral values to make positive impacts in the world

Active Learning Methods	Active learning method in this class requires students to work individually or in groups, to solve problems, propose solutions, and explain ideas in writing.
Use of ICT in Class	UNIPA (LMS system), Office 365.
Use of ICT outside Class	UNIPA (LMS system), ChatGPT, Office 365.

Expected study hours outside class	It is important to work each day, especially before and after the class. Plan to spend 8 hours per week for the class.
Feedback Methods	UNIPA, and Office 365 will be used for regular feedback to quizzes. Student can use office hours for discussion.

Grading Criteria		
Grading Methods	Grading Weights	Grading Content
In-class quizzes	100%	Nine quizzes will be conducted during the course. See the grading rubric.

Required Textbook(s)	1. Karl J. Smith - The Nature of Mathematics - Brooks/Cole, Cengage Learning. 2. Math100: Liberal Arts Mathematics, Saburo Matsumoto (available for free download via the open education resource, LibreTexts project.
Other Reading Materials/URL	The Heart of Mathematics: An invitation to effective thinking, Edward Burger and Michael Starbird, (4th Edition) John Wiley.
Plagiarism Policy	Plagiarism is the dishonest presentation of the work of others as if it were one's own. Duplicate submission is also treated as plagiarism. Depending on nature of plagiarism you may fail the assignment or the course. Repeated act of plagiarism will be reported to the University which may apply additional penalties.
Other Additional Notes	This class will be conducted primarily as an interactive lecture. Students are expected to participate in class discussions in an inquisitive, thoughtful, and constructive manner. We will follow the textbook reasonably closely and students should review the suggested study materials before joining the class. To have a better grade be regular in the course, be active and attentive in the class, do revision of classwork on a regular basis, and participate in class quizzes.

(NOTE 3) Class schedule is subject to change

Class Schedule	
Class Number	Content
Class 1	Introduction to the course, mathematics and the art of problem solving.
Class 2	Critical Thinking, "What is problem solving" (Polya's method).
Class 3	Fallacies of common language, logic, truth tables, analyzing arguments.

Class 4	Fallacies of common language, logic, truth tables, analyzing arguments. In-class quiz.
Class 5	Nature of sets: Sets, Subsets. Venn diagrams.
Class 6	Nature of sets: Set operations and applications. Finite and Infinite sets.
Class 7	Review of concepts. In-class quiz.
Class 8	Mathematics and numbers: Early numeration systems, Babylonian and Egyptian systems.
Class 9	Mathematics and numbers: Early numeration systems, Roman system. Decimal system, the Hindu Arabic numerals,
Class 10	Mathematics and numbers: Binary systems, Natural, Prime, Integers, Rational and Irrational numbers. Estimation, Big and Small numbers, Percentages and Proportions.
Class 11	A review of concepts. In-class quiz.
Class 12	The nature of algebra: Polynomials, Factoring.
Class 13	The nature of algebra: Equations, Inequalities, Algebra in problem solving.
Class 14	A review of concepts. In-class quiz.
Class 15	Mathematics and finance: Simple and Compound interest.
Class 16	Mathematics and finance: Annuities and Loans, Continuous Compounding.
Class 17	Mathematics and finance: Federal Budget and National Debt. In-class quiz.
Class 18	Mathematics of Chance: Probability basics.

Class 19	Mathematics of Chance: Conditional probability and Expected Value.
Class 20	A review of concepts. In-class quiz.
Class 21	Data and Statistics: Basic Statistics, Describing Data.
Class 22	Data and Statistics: Numerical measures of Central Tendency.
Class 23	Data and Statistics: Normal Distribution. In-class quiz.
Class 24	Mathematics and the Arts: Projective geometry, The golden ration, Fibonacci sequence, Music, Fractals, Networks and trees.
Class 25	Mathematics and the Arts: Projective geometry, The golden ration, Fibonacci sequence, Music, Fractals, Networks and trees.
Class 26	Mathematics and the Arts: In-class quiz.
Class 27	Mathematics and Politics: Apportionment.
Class 28	Mathematics and Politics: Voting theory.
Class 29	Mathematics and Politics: Weighted voting. Power Index.
Class 30	A review of concepts. In-class quiz.