

**5. COURSE NAME: (CMRG 125) MATHEMATICAL REASONING AND GEOMETRY**

**LEVEL: YEAR ONE, SEMESTER-II**

**CREDIT UNITS: 3**

**CONTACT HOURS: 45**

**COURSE OBJECTIVES:**

The course aims to:

1. Introduce students to coordinate geometry, mathematical statements which are relevant to the understanding of object-oriented programming.
2. Provide students with an in-depth knowledge.

**LEARNING OUTCOMES:**

Upon successful completion of this course students should be able to relate the knowledge acquired to:

- i. Develop a solid grasp of fundamental mathematical concepts and logic.
- ii. Enhance problem-solving skills by applying mathematical reasoning to algorithm design.
- iii. Create efficient and effective algorithms based on sound mathematical principles.
- iv. Analyze the computational complexity of algorithms using mathematical reasoning.
- v. Understand Big O notation and use it to evaluate the performance of code.

**COURSE OUTLINE**

<b>Unit No</b>	<b>Contents</b>	<b>No Of Lectures</b>
<b>1</b>	<b>1. Mathematical Reasoning</b>  1.1 Mathematically acceptable statements. 1.2 Connecting words or phrases—consolidating the understanding of “if and only if (necessary and sufficient) condition”, “implies”, “and/or”, “implied	<b>10</b>

	<p>by”, “and”, “or”, “there exists” and their use through a variety of examples related to real life and mathematics.</p> <p>1.3 Identifying simple statements from compound statements, and writing compound statements using simple statements.</p> <p>1.4 Validating statements involving connecting words.</p> <p>Difference between contradiction, converse, and contrapositive</p>	
<b>2</b>	<p><b>2. Coordinate Geometry</b></p> <p>2.1 Length of a line.</p> <p>2.2 Midpoint of a line.</p> <p>2.3 Parallel and perpendicular lines.</p> <p>2.4 Co-linearity.</p> <p>2.5 Equation of a straight line.</p> <p>2.6 Shortest distance of a point from a given line.</p> <p>2.7 The angle between lines.</p> <p>2.8 Intersection of lines.</p> <p>2.9 The section formula.</p> <p>2.10 The area of a triangle whose vertices are given in point form.</p>	<b>15</b>
<b>3</b>	<p><b>3. Trigonometry</b></p> <p>3.1 Positive and negative angles.</p> <p>3.2 Measuring angles in radians and degrees, and conversions from one measure to another.</p> <p>3.3 Finding trigonometric ratios of sin, tan, cosec, sec, and cot using a right-angled triangle, and application to angles of elevation and depressions.</p> <p>3.4 Solving triangles using the sine and cosine rule.</p> <p>3.5 Truth of the identity <math>\sin^2 x + \cos^2 x = 1, \forall x</math>.</p> <p>3.6 Trigonometric ratios of <math>30^\circ, 45^\circ</math>, and <math>60^\circ</math> and extending the concept to finding the exact value of large angles without using a calculator or tables.</p> <p>3.7 Expressions of <math>\sin(x \pm y)</math> and <math>\cos(x \pm y)</math> in terms of <math>\sin y, \sin x, \cos y</math>, and <math>\cos x</math> and their simple applications.</p> <p>3.8. Derivation of <math>\sin 2x, \cos 2x, \tan 2x, \sin 3x, \cos 3x</math>, and <math>\tan 3x</math> using the concept of double angles without any further applications, only derivations.</p>	<b>20</b>

**MODE OF DELIVERY:**

Lectures, practicals, discussions, demonstrations

**COURSE ASSESSMENT:**

Assessment Contribution	Practical 40%	Final Exam 60 %	Total 100 %
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**6. COURSE NAME: (CSDA 126) REAL LIFE PROJECT II [DYNAMIC WEBSITE]**

**LEVEL: YEAR ONE, SEMESTER-II**

**CREDIT UNITS: 3**

**CONTACT HOURS: 45**

**COURSE OBJECTIVES:**

The objectives of the course are to:

1. To enable students, apply the Fundamentals, building blocks and Advance Concepts of PHP using Web forms in complete details which are essentials for beginners or they can implement .
2. To enable students, develop real life projects using C and C++.
3. To enable students implement customer needs.
4. To teach students how to deploy PHP applications.
5. To teach students how to carry out software tests in PHP using

**COURSE DESCRIPTION:**

This course provides a systematic and thorough introduction to all aspects of PHP Web forms & MSSQL and the mobile Application development. Projects are an increasingly important aspect of modern business, so we begin with the relation between projects and the strategic goals of the organization. We move on to discuss the technical, cultural, and interpersonal skills necessary to successfully manage projects from start to finish. The course emphasizes that project management is a professional discipline with its own tools, body of knowledge, and skills. Concepts are reinforced by case studies covering a wide variety of project types and industries.