



## UNIVERSITI TEKNOLOGI MARA

### MAE412: FUNDAMENTAL OF MEASUREMENT FOR PRIMARY SCHOOL TEACHERS

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| <b>Course Name (English)</b>  | FUNDAMENTAL OF MEASUREMENT FOR PRIMARY SCHOOL TEACHERS<br><b>APPROVED</b>  |
| <b>Course Code</b>  | MAE412   |
| <b>MQF Credit</b>   | 3  |
| <b>Course Description</b>   | This course discusses the mathematical content in the area of measurements which covers the topics of length, area, weight (and mass), volume & capacity, and time. Students will review their knowledge and understanding of the concepts of the stated measures; deepen their knowledge of the subject matter and improve their strategies for teaching these concepts of measures. The students will enhance their knowledge of measures where this course will stress on concepts rather than numbers and computations. Conceptual knowledge of measure refers to understanding the nature of the measure, understanding how the use of standard units produces a measure and understanding the way measuring instruments work. We will also examine knowledge of how children's thinking and learning the above topics. The development of pedagogical content knowledge for each topic will be discussed in detail. The appropriate concrete materials, to introduce and develop the concepts and skills for certain topics will also be discussed |
| <b>Transferable Skills</b>  | Reflective Learner<br>Independent and Critical Thinker<br>Expert in Field  |
| <b>Teaching Methodologies</b>   | Lectures, Blended Learning, Tutorial, Discussion   |
| <b>CLO</b>  | CLO1 1. Analyze the concepts of measurements and its development.<br>CLO2 2. Discuss the difficulties and misconceptions faced by pupils in the learning of measurement concepts.<br>CLO3 3. Construct pedagogical content knowledge for measurement concepts.<br>CLO4 4. Integrate the usage of concrete materials for the teaching of measurement concepts.  |
| <b>Pre-Requisite Courses</b>  | No course recommendations  |
| <b>Topics</b>   |  |
| <b>1. Length and Perimeter</b><br>1.1) 1. Concepts of length and perimeter.<br>1.2) 2. Non-Standard and standard unit of measure.<br>1.3) 3. Difficulties and misconceptions in the learning of length and perimeter.<br>1.4) 4. Pedagogical Content knowledge for concept development in the teaching of length and perimeter<br>1.5) 5. Integration of concrete materials for the teaching of length and perimeter. |  |
| <b>2. Area</b><br>2.1) Concept of measuring area and development of formulas.<br>2.2) Difficulties and misconceptions in learning the concepts of area.<br>2.3) Pedagogical Content knowledge for concept development in the teaching of area concepts.<br>2.4) Integration of concrete materials for the teaching of area concepts.  |  |
| <b>3. Volume and Capacity</b><br>3.1) Measuring the volume of an object.<br>3.2) Volume and Capacity Using Standard Units.<br>3.3) Difficulties and misconceptions in the learning of volume and capacity.<br>3.4) Pedagogical Content knowledge for concept development in the teaching of volume and capacity.<br>3.5) Integration of concrete materials for the teaching of volume and capacity concepts.          |  |

**4. Mass and Weight**

- 4.1) Meaning of mass and weight.
- 4.2) Need for standard units
- 4.3) Difficulties and misconceptions in learning the concepts of mass and weight
- 4.4) Pedagogical Content knowledge for concept development in mass and weight concepts.
- 4.5) Integration of concrete materials for the teaching of mass and weight concepts.

**5. Time**

- 5.1) Measuring time.
- 5.2) Difficulties and misconceptions in time concepts.
- 5.3) Pedagogical Content knowledge for concept development in time concepts.
- 5.4) Integration of concrete materials for the teaching of time concepts.

| Assessment Breakdown  | %      |
|-----------------------|--------|
| Continuous Assessment | 60.00% |
| Final Assessment      | 40.00% |

| Details of Continuous Assessment | Assessment Type    | Assessment Description | % of Total Mark | CLO                       |
|----------------------------------|--------------------|------------------------|-----------------|---------------------------|
|                                  | Discussion         | i-Class                | 10%             | CLO1 , CLO2 , CLO3 , CLO4 |
|                                  | Individual Project | Lesson Plan            | 20%             | CLO1 , CLO2 , CLO3 , CLO4 |
|                                  | Quiz               | Quiz 1                 | 15%             | CLO1 , CLO2               |
|                                  | Quiz               | Quiz 2                 | 15%             | CLO2 , CLO3               |

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| Reading List       | Recommended Text                              | <ul style="list-style-type: none"> <li>Lee Peng Yee &amp; Lee Ngan Hoe 2009, <i>Teaching Primary School Mathematics A Resource Book</i>, 2 Ed., McGraw Hill.</li> <li>Sobel, M. A. &amp; maletsky, E. M. 1999, <i>Teaching mathematics: A sourcebook of aids, activities and strategies.</i>, Boston: Allyn and Bacon</li> </ul> |
| Article/Paper List | Recommended Article/Paper Resources           | <ul style="list-style-type: none"> <li>Outhred, L. N. &amp; Mitchelmore 2000, Young children's intuitive understanding of rectangular area measurement., <i>Journal for Research in Mathematics Education</i>, 31(2),, 144</li> </ul>  |
| Other References   | This Course does not have any other resources |  |