CIVIL ENGINEERING MATERIALS (LABORATORY) VERSION 2022

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Abstract: This book aims to expose learners to common mistakes done while writing C ++ programming language codes. This book covers the fundamentals of C++ programming language which relate to basic C++ concepts such as basic elements of C ++, selection, looping, function and array and it is associated with structured programming. This book is compiled based on the authors' experience who had taught C++ programming for more than 7 years. It is the common syntax errors that are often done by students. This is the reason why this book is produced in the first place. This book also includes tips on how to avoid the mistakes by showing the correct syntax. The book is made up of 14 sections, each showing various errors and its correction. For each error there is a solution on the correct syntax. This book also employs simple English; this makes it one of the must-have guide book for beginners. Hopefully, this book will prove beneficial to all learners especially to beginner of C++ language.

Keywords: Engineering, common, programming, syntax, fundamental

FIRST EDITION

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CONTENT

PREFACE

In recent years, construction technology one of sector that important in several year. Rapid development causes various materials to be created to provide the best quality to building development. This book provides exposure to readers related to various basic laboratory currently used in construction sector. Specific laboratory instruction includes in this book including Vicat Consistency Test (MB01), Sieve Analysis of Fine aggregate (MB02), Sieve Analysis of Course aggregate (MB03), Workability and compressive strength of concrete (MB04), Rebound Hammer test (MB05), Density, Water Absorption and Compressive Strength of a Brick (MB06), Water Absorption of Wood (MB07), and Tensile Strength Test (MB08). This book provides related understanding the civil engineering material testing according to the current standard guideline.

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2022

INTRODUCTION

This book will give the readers an understanding of the Civil Engineering Materials (Laboratory) version 2022 for the course DAC 11603 offered by the Centre for Diploma Studies (CeDS), Universiti Tun Hussein Onn Malaysia (UTHM).

AIM

This book aims to provide understanding to the students about the role of civil engineer in construction application. This book provides exposure to students related to various basic laboratory currently used in construction sector. Specific laboratory instruction include in this book which are:

- ❖ Vicat Consistency Test (MB01)
- ❖ Sieve Analysis of Fine aggregate (MB02)
- ❖ Sieve Analysis of Course aggregate (MB03)
- ❖ Workability and compressive strength of concrete (MB04)
- ❖ Rebound Hammer test (MB05)
- ❖ Density, Water Absorption and Compressive Strength of a Brick (MB06)
- ❖ Water Absorption of Wood (MB07)
- ❖ Tensile Strength Test (MB08)

LEARNING OUTCOMES

At the end of this book, readers will be able to:

- ❖ Apply the types of construction materials according to application and current technology in civil engineering. (LOD 1, PLO 1, C3)
- ❖ Demonstrate the civil engineering material testing according to the current standard guideline. (LOD 5, PLO 5, P3)
- ❖ Recommend sustainable civil engineering materials and technology according to the sustainable building requirement. (LOD 18, PLO 7, A2)

REPORT COVER

UNIVERSITI TUN HUSSEIN ONN MALAYSIA
Centre for Diploma Studies

DEPARTMENT OF CIVIL ENGINEERING

LAPORAN MAKMAL

LABORATORY REPORT

Kod & Nama Kursus *Course Name & Code*			
Tajuk Ujikaji *Title of Experiment*			
Seksyen *Section*			
Kumpulan *Group*			
Nama Pensyarah/Pengajar *Lecturer/Instructor's Name*			
Nama Ketua Kumpulan *Name of Group Leader*		**No. Matrik** *Matric No.*	

Ahli Kumpulan *Group Members*	**No. Matrik** *Matric No.*	**Penilaian Laporan (%)** *Report Assessment (%)*		
1.		**Objektif &Teori** *Objectives & Theory*	**5**	
2.		**Prosedur** *Procedures*	**5**	
3.		**Data** *Data*	**5**	
4.		**Analisis & Keputusan** *Analysis & Result*	**12.5**	
		Perbincangan *Discussion*	**12.5**	
		Kesimpulan & Cadangan *Conclusion & Recommendation*	**7.5**	
		Rujukan *References*	**2.5**	
Tarikh Ujikaji *Date of Experiment*		**JUMLAH** *TOTAL*	**100**	
Tarikh Hantar *Date of Submission*				

ULASAN PEMERIKSA/COMMENTS	**COP DITERIMA/**RECEIVED STAMP

Universiti Tun Hussein Onn Malaysia

STUDENT CODE OF ETHIC (SCE)

DEPARTMENT OF CIVIL ENGINEERING

CENTRE FOR DIPLOMA STUDIES

We, hereby confess that we have prepared this report on our own effort. We also admit not to receive any help from any third party during the preparation of this report and pledge that everything mentioned in the report is true.

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1) Group Leader _____ (Signature)
   Name : _____
   Matrix No. : _____

2) Group Member 1 _____ (Signature)
   Name : _____
   Matrix No : _____

3) Group Member 2 _____ (Signature)
   Name : _____
   Matrix No. : _____

4) Group Member 3 _____ (Signature)
   Name : _____
   Matrix No. : _____

Universiti Tun Hussein Onn Malaysia

CENTER FOR DIPLOMA STUDIES

DEPARTMENT OF CIVIL ENGINEERING

CONCRETE TECHNOLOGY WORKSHOP

LABORATORY INSTRUCTION SHEETS

COURSE CODE	DAC 11603
COURSE NAME	CIVIL ENGINEERING MATERIALS
EXPERIMENT TITLE	MB01 VICAT CONSISTENCY TEST

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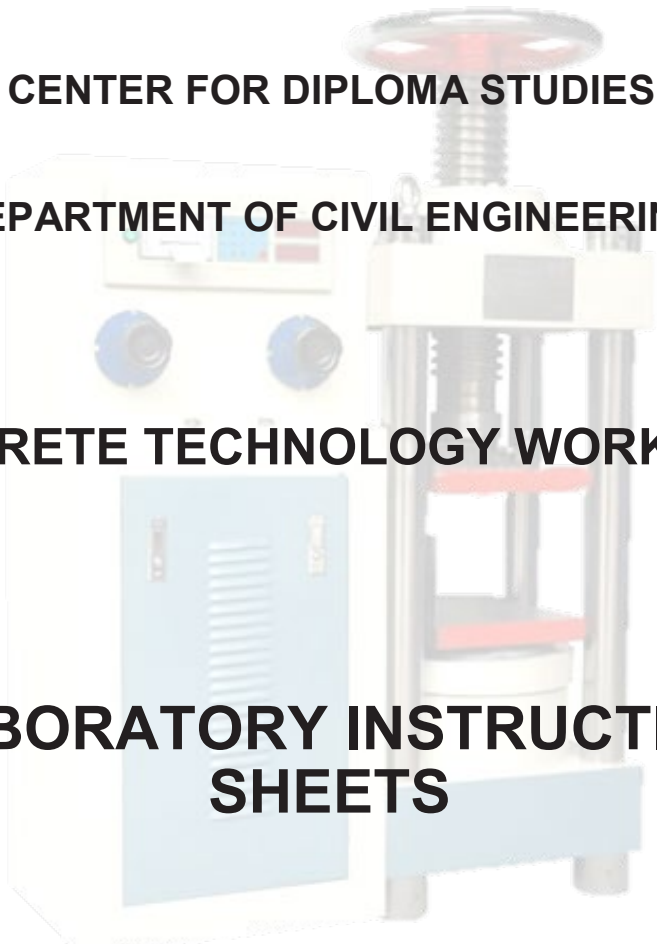
CONCRETE TECHNOLOGY WORKSHOP

LABORATORY INSTRUCTION SHEETS

COURSE CODE	DAC 11603
COURSE NAME	CIVIL ENGINEERING MATERIALS
EXPERIMENT TITLE	MB02 SIEVE ANALYSIS OF FINE AGGREGATE



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CONCRETE TECHNOLOGY WORKSHOP

LABORATORY INSTRUCTION SHEETS

COURSE CODE	DAC 11603
COURSE NAME	CIVIL ENGINEERING MATERIALS
EXPERIMENT TITLE	MB04 WORKABILITY AND COMPRESSIVE STRENGTH OF CONCRETE

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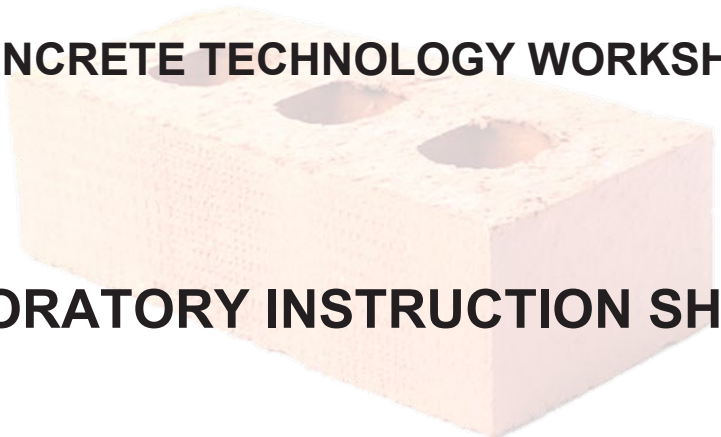
CONCRETE TECHNOLOGY WORKSHOP



LABORATORY INSTRUCTION SHEETS

COURSE CODE	**DAC 11603**
COURSE NAME	**CIVIL ENGINEERING MATERIALS**
EXPERIMENT TITLE	**MB06 DENSITY, WATER ABSORPTION AND COMPRESSIVE STRENGTH OF A BRICK**

REFERENCE

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AUTHOR'S BIOGRAPHY

Noorul Hudai Binti Abdullah is currently a senior lecturer in Civil Engineering Department, Centre for Diploma Studies since April 2019 at Universiti Tun Hussein Onn Malaysia (UTHM). She experienced in teaching Civil Engineering materials course since 2019.

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Hazri Bin Mokhtar is currently an assistant engineer since 2001 at Universiti Tun Hussein Onn Malaysia (UTHM). He assists laboratory work in Civil Engineering Materials Course at Concrete Technology Workshop since 2017.

DAC 11603

Civil Engineering Materials

(Laboratory)

Version 2022

The writers of this book as a guideline to understanding of the Civil Engineering Materials (Laboratory) version 2022 for the course DAC 11603 offered by the Centre of Diploma Studies (CeDS), Universiti Tun Hussein Onn Malaysia (UTHM). This book is divided into six (6) experiments: -

i. MB01 Vicat Consistency Test to determine the amount of water required for normal consistency according to a specific procedure.
ii. MB02 Sieve Analysis of Fine Aggregate experiment to obtain grading curve of fine aggregate.
iii. MB03 Sieve Analysis of Coarse Aggregate experiment to obtain grading curve of coarse aggregate.
iv. MB04 Workability and Compressive Strength of Concrete experiment to study the workability of the designed mix and compressive strength of concrete cubes.
v. MB05 Rebound Hammer Test to check the uniformity of concrete, to determine the properties of the surface of the concrete, and to estimate strength of concrete in structures.
vi. MB06 Density, Water Absorption and Compressive Strength of a Brick experiment to determine the density, water absorption, and compressive strength of brick according to the Malaysian standard.

Diploma of civil engineering students will benefit from this book.