



Laboratory  
Manual

APPLIED  
MECHANICS

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PENERBIT  PRESS  
UNIVERSITI TEKNOLOGI MARA

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E-mail: penerbit@uitm.edu.my

UiTM Press is a member of  
**MALAYSIAN SCHOLARLY PUBLISHING COUNCIL**

Perpustakaan Negara Malaysia      Cataloguing-in-Publication Data

ISBN 978-967-363-881-9

Cover Design: Arif Zulhimi Mohd Zin  
Typesetting: Mohd Fadhel Mohd Drus

Printed in Malaysia by : UiTM Printing Centre  
College of Creative Arts Studies  
Universiti Teknologi MARA  
40450 Shah Alam  
Selangor

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# PREFACE

This laboratory manual has been prepared to acquaint undergraduate students to the course MEC 424 Applied Mechanics Lab. This course is an essential component of the EM220 Mechanical Engineering Programme. The main objective of the course is to provide hands-on experience for students, so they are able to apply theoretical concepts into practice.

The manual covers three main laboratories under this course namely Material Science, Dynamics and Strength. Each laboratory consists of three sets of experiments. The presentation of all experiments is structured in a manner that each of them contains an introduction, application or case study, experimental information and key principle. This manual describes detailed procedures for conducting each experiment that is supported with suitable tables and figures. The present manual also includes safety regulations that are strictly followed to avoid accidents in the laboratory.

The main intent of this laboratory manual is to define a clear guidance that can be followed by students as well as lab instructors and technicians. Furthermore, we hope that this manual can also serve as a reference for laboratories seeking to establish their own standards and experiments.

Last but not least the authors would also like to express their sincere gratitude towards all previous lecturers of this course; Associate Professor Nor' Aini Wahab, Associate Professor Ya'kub Md Taib, Associate Professor Dr Muhammad Hussain Ismail, all assistant engineers, the Faculty of Mechanical Engineering management team and everyone involved directly or indirectly for the encouragement, help and support in publishing this manual.

# **INTRODUCTION TO APPLIED MECHANICS LABORATORY COURSE**

## **INTRODUCTION**

Applied Mechanics Lab (MEC424) consists of three types of laboratory (Material Science, Dynamics and Strength of Material) that provides students with the opportunity to apply knowledge in mechanics and adapting to the Mechanical Engineering Programme. Each class of student will be divided into three (3) groups and parallel sessions will be carried out for each lab for four (4) weeks each and rotations will be done to complete all three courses of experiments. The team is formed by the course Resource Person (RP) to ensure smooth running for the course. All information and announcements for MEC424 is displayed on the notice board in each lab.

## **COURSE OUTCOMES**

At the end of the course, students should be able to:

1. Apply fundamental knowledge in order to meet the objectives and background of each experiment.
2. Work collaboratively in a group to complete an assigned experiment through established procedures and good record keeping.
3. Construct experimental and interpret data accordingly as required by each experiment.
4. Organize effective report based on clear instructions and effective communication among group members.