



Manual *of Open-Ended* *Laboratory (OEL)*

Faculty of Engineering

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PREFACE & ACKNOWLEDGEMENT

This First Edition of Manual of Open-Ended Lab (OEL) for Civil Engineering Lab courses in the Faculty of Engineering, Universiti Malaysia Sarawak is written to fulfil the requirement of Outcome Based Education in Engineering Education by the Engineering Accreditation Council Malaysia. It consists of six (6) parts from Year 1 to Year 3. Each part comprises of two core subjects in laboratory except for the first year. The subject lists and codings used in this book are: First Year (Concrete (C), Survey (V) and Strength of Materials (S)), Second Year (fluid Mechanics (F), Soil Mechanics (L), Hydraulics (H) and Geotechnical (G) and Third Year (Higway (J), Hydrology (Y), Transportation (T) and Water/Wastewater (W)). The laboratory exercises are tied closely to the core courses in Civil Engineering Programme. Since this is the first edition, feedback and suggestions are most welcome especially from instructors, lab technicians and students. I am grateful to the Task Force Team consists of all Civil Engineering Lecturers that have contributed as authors and editors. On behalf of the team I would like to especially thank the Program Coordinator of Civil Engineering Department, Dr Mah Yau Seng, Head of Department of Civil Engineering, Dr Mohamad Raduan Kabit , Deputy Dean Academic of Faculty of Engineering, Associate Professor Dr Abdullah Yassin and last but not least Dean of Faculty of Engineering, Associate Professor Dr Al-Khalid Othman for their full support and guidance towards the completion of this OEL Manual.

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This Manual of Open-Ended Lab (OEL) for Civil Engineering Lab courses consists of six (6) parts from Year 1 to Year 3 of Civil Engineering Undergraduate Programme. The subject lists are: First Year (Concrete, Survey and Strength of Materials), Second Year (Fluid Mechanics, Soil Mechanics, Hydraulics and Geotechnical) and Third Year (Highway, Hydrology, Transportation and Water/Wastewater). The laboratory exercises are tied closely to the core courses in Civil Engineering Programme.



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