Research Methodology

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About the Author

Professor Robert H. B. Exell was born in England in 1933, and was educated at King's College School, Wimbledon, and Magdalen College, Oxford. He obtained his doctor degree in 1962 for research in low temperature physics at the Clarendon Laboratory, Oxford.

In 1962 he came to Thailand and taught mathematics and physics at Chulalongkorn University for ten years.

In 1972 he moved to the Asian Institute of Technology (AIT). There he was Associate Director of the Regional Energy Resources Information Center (1978 to 1993), Dean of Student Affairs (1988 to 1993), and Chairman of the Division of Energy Technology (1991 to 1993). His research was mostly in solar energy. He retired from AIT in 1993 as an Emeritus Professor.

In 1993 he was awarded the honorary degree of Doctor of Science in Applied Mathematics by King Mongkut's Institute of Technology Thonburi, now renamed King Mongkut's University of Technology Thonburi (KMUTT). He joined the Department of Mathematics, KMUTT, in 1994, and since 2000 his time has been shared between the Department of Mathematics and the Joint Graduate School of Energy and Environment (JGSEE). He also teaches research methodology at the Sirindhorn International Institute of Technology (SIIT), and he is a consultant to the Cellennium (Thailand) Company Limited, which is developing vanadium flow batteries for electricity storage and conversion.

Foreword

It is well known that in Thai universities the thesis options of master degree programmes normally take longer to complete than taught-course options of the same programmes. As a result, master degree students prefer the taught-course options to the thesis options.

I believe that a good course and a good textbook on Research Methodology will help shorten the time taken by students to complete their theses. Having been asked by Professor Exell to write a short foreword for his new book on Research Methodology, I spent some time reading every page of the book and initially intended to highlight some of the chapters. By the time I completed the reading, I realized that Professor Exell wrote not only an excellent textbook but also a *manual* on Research Methodology with chapters, for example, on *Ethics and Good Practice in Research*, *The English Language*, etc.

I am sure that, if master degree students read the book thoroughly, most of them will be able to complete their theses in time. I strongly recommend the book to postgraduate students in science, engineering, technology, and even some branches of social science. The book is also recommended to those who teach Research Methodology to senior and postgraduate students.

Prida Wibulswas
Fellow of the Royal Institute of Thailand and Emeritus Professor of Energy Technology, KMUTT

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Preface

In 1998 the Sirindhorn International Institute of Technology (SIIT), Thammasart University, and the Joint Graduate School of Energy and Environment (JGSEE), King Mongkut's University of Technology Thonburi, invited me to develop and teach a new course entitled *Research Methodology*. I was given the freedom to include in the course whatever topics I considered would best serve the needs of our graduate students.

Then, three years ago, Professor Prida Wibulswas, at that time Director of SIIT, observed that no suitable textbook for this course was readily available in Thailand, and he asked me to write such a book. This book is a first attempt to fill the need.

Many of the topics in the book are taken from my own experience in research; they are things that I had to do myself in my own research. However, I am aware that these topics may not suit everybody. Therefore I welcome suggestions for improvements from readers—both students and instructors. The essential topics come in the early chapters. The chapters are complete in themselves, and can be read in any order.

This printed edition has been made with the support of the JGSEE, and has been produced and distributed by the Technical Information Service (TIS), KMUTT campus. Materials associated with the Research Methodology course are available on my web site at:

www.jgsee.kmutt.ac.th/exell/

R. H. B. E.
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