

CHAPTER I

INTRODUCTION

1.1 Background Problem

Engineering Metallurgy course composes of many specific topics that quite difficult to understand such as metal lattice, phase diagram, crystal deformation, crystallization and annealing process. These topics describes about three dimensional structure and/or compose of various steps of complex alteration that are difficult to understand by imagination from a single picture or set of plain figures. The multimedia technology such as three dimensional simulation and animation are expected to reduce these problems.

By learning with multimedia tutorial guide, students are expected to get better understanding on most of complex topics in Engineering Metallurgy course. In addition, full multimedia presentation including hypertext, and interactive lesson make the course more attractive to learn and student can use this multimedia tutorial guide on Engineering Metallurgy for self-learning.

Therefore developing the multimedia tutorial guide on engineering metallurgy course (EM-CAI) for use as a “Computer Assisted Instruction” (CAI) should be useful for both student and lecturer. As student can learn more within a shorter period and lecturer would have spare time for other task.

1.2 Objective

This work is aimed to develop an interactive tutorial guide or CAI to help in teaching undergraduate engineering students the Engineering Metallurgy course. It is intended to use a full feature of computer multimedia to provide students with a tutorial tool that is more attractive to learn and gives more control to users than lecture note or text book. Although it was not intended to replace classroom, it was hope to provide as much as possible interaction between teacher and learner, which is used to be restricted to only classroom to self-learning. In addition to development of the EM-CAI, a second important task of this thesis is to evaluate the effectiveness of the tool.

1.3 Scope of Work

1.3.1 To Develop the EM-CAI

This Tutorial Guide will cover the first part of Engineering Metallurgy course as shown below.

- Chapter 1 : Electronic and Atomic Properties
- Chapter 2 : Chemical Reactions and Equations
- Chapter 3 : Crystal Structures
- Chapter 4 : Directions and Planes in Crystals
- Chapter 5 : Imperfections in Crystalline Metals
- Chapter 6 : Diffusion
- Chapter 7 : Deformation in Metals

- Chapter 8 : Strengthening Mechanisms
- Chapter 9 : Annealing Heat Treatment and Grain Growth
- Chapter 10 : Important Properties of Materials
- Chapter 11 : The Development of Microstructure

These contexts will be presented with full feature of the multimedia technology as interactive lesson.

1.3.2 To Evaluate the Effectiveness of the EM-CAI

The effectiveness of the EM-CAI will be evaluated by using questionnaire and statistic methods as describes in chapter V.