

TABLE OF CONTENTS

APPROVAL PAGE	ii
SELF DECLARATION AGAINST PLAGIARISM	iii
ABSTRACT	iv
ABSTRAK	v
ACKNOWLEDGMENTS	1
TABLE OF CONTENTS	2
LIST OF TABLES	5
LIST OF FIGURES	6
CHAPTER 1: THE PROBLEM	7
1.1 Rationale	7
1.2 Theoretical Framework	8
1.2.1 University Timetabling	8
1.2.2 Informed Genetic Algorithm	8
1.2.3 Island Model GA	9
1.3 Conceptual Framework/Paradigm	9
1.3.1 Inputs	9
1.3.2 Process	9
1.3.3 Outcome	9
1.4 Statement of the Problem	10
1.5 Hypothesis	10
1.6 Assumption	10
1.7 Scope and Delimitation	10
1.8 Importance of the Study	11
CHAPTER 2: REVIEW OF LITERATURE AND STUDIES	12
2.1 Timetabling	12
2.2 University Course Timetabling Problem	13
2.3 Telkom University Course Timetabling Problem	13
2.4 Genetic Algorithm	14

2.5	Island Model Genetic Algorithm.....	16
CHAPTER 3: RESEARCH METHODOLOGY		18
3.1	System Design.....	18
3.1.1	Architecture Design	18
3.1.2	Genetic Algorithm Model Design	19
3.1.3	Architecture of Island Model GA	23
3.2	UniTime.....	25
3.2.1	UniTime Data Format.....	25
3.2.2	UniTime Constraints.....	26
3.3	Telkom University Data Structure	27
3.4	Constraint Mapping	28
3.4.1	Constraint Mapping from Island Model GA into Unitime	28
3.4.2	Constraint Mapping from Unitime GA into Island Model	29
3.5	Validity Test for Translation Result	30
3.6	Tools for Data Analysis.....	31
3.7	Testing Scenario	31
3.7.1	System Performance Testing Scenario 1 - Telkom University course timetabling problem into Island Model GA.....	31
3.7.2	System Performance Testing Scenario 2 - UniTime course timetabling problem into Island Model GA	32
3.7.3	System Performance Testing Scenario 3 - Telkom University course timetabling problem into UniTime	32
3.7.4	System Performance Testing Scenario 4 – Efficient Number of Island Model GA.....	32
CHAPTER 4: PRESENTATION, ANALYSIS AND INTERPRETATION OF DATA.....		33
4.1	Presentation of Data.....	33
4.1.1	Result of System Performance Testing Scenario 1 - Telkom University course timetabling problem into Island Model GA.....	33
4.1.2	Result of System Performance Testing Scenario 2 - UniTime course timetabling problem into Island Model GA.....	38
4.1.3	System Performance Testing Scenario 3 - Telkom University course timetabling problem into UniTime	42
4.1.4	System Performance Testing Scenario 4 - Efficient Number of Island Model GA.....	45

4.2	Summary of Findings.....	48
CHAPTER 5: CONCLUSIONS AND RECOMMENDATIONS.....		49
5.1	Conclusions.....	49
5.2	Recommendations.....	49
Bibliography		50
Appendix A – UniTime Data Format Example.....		53

Telkom University Grad. School