

**UNIVERSITI TEKNOLOGI MARA**

**TECHNICAL REPORT**

**AUXILIARY POLICE PATROL SCHEDULING USING GRAPH  
COLOURING METHOD**

**(P42M23)**

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# TABLE OF CONTENTS

<b>ACKNOWLEDGEMENTS .....</b>	<b>ii</b>
<b>TABLE OF CONTENTS .....</b>	<b>iii</b>
<b>LIST OF TABLES .....</b>	<b>v</b>
<b>LIST OF FIGURES .....</b>	<b>vi</b>
<b>ABSTRACT.....</b>	<b>vii</b>
<b>CHAPTER 1:INTRODUCTION.....</b>	<b>1</b>
1.1 MOTIVATION.....	1
1.2 PROBLEM STATEMENT.....	5
1.3 OBJECTIVES.....	5
1.4 SIGNIFICANCE OF THE STUDY.....	6
1.5 SCOPE AND LIMITATION OF THE STUDY.....	8
1.6 DEFINITION OF TERMS AND CONCEPTS .....	9
<b>CHAPTER 2: BACKGROUND THEORY AND LITERATURE REVIEW .....</b>	<b>10</b>
2.1 INTRODUCTION .....	10
2.2 BACKGROUND THEORY.....	10
2.3 PAST STUDIES ON GRAPH COLORING. ....	12
2.4 ADVANTAGES AND DISADVANTAGES OF GRAPH COLORING .....	14
2.4.1 ADVANTAGES OF GRAPH COLORING.....	14
2.4.2 DISADVANTAGES OF GRAPH COLORING .....	14
2.5 GAP ANALYSIS ON MATHEMATICAL MODEL OF SCHEDULING PROBLEM....	15
2.5.1 TYPES OF APPLICATION .....	15
2.5.2 TYPES OF MATHEMATICAL MODEL.....	16
2.5.3 OBJECTIVES FUNCTION.....	16
2.6 SUMMARY .....	19
<b>CHAPTER 3: METHODOLOGY AND IMPLEMENTATION.....</b>	<b>20</b>
3.1 INTRODUCTION .....	20
3.2 PHASE 1: SETTING UP PHASE .....	21
3.2.1 LITERATURE REVIEW .....	21
3.2.2 IDENTIFY PROBLEM STATEMENT .....	21
3.3 PHASE 2: COLLECTING AND ANALYSIS THE DATA .....	22
3.3.1 DATA COLLECTION .....	22
3.3.2 DATA ANALYSIS.....	25

3.4 PHASE 3: FORMULATION AND OPTIMIZATION OF AUXILIARY SCHEDULE ...	27
3.4.1 OVERVIEW OF GRAPH THEORY .....	27
3.4.2 IDENTIFY CONSTRAINTS.....	30
3.4.3 FORMULATION OF THE MODEL .....	30
3.4.4 OPTIMIZATION FOR AUXILIARY POLICE SCHEDULE .....	32
3.4.5 SOLVING USING GRAPH COLOURING.....	33
3.5 PHASE 4: RESULT AND VALIDATION .....	33
3.5.1 RESULT .....	33
3.5.2 VALIDATION.....	33
3.6 SUMMARY .....	33
<b>CHAPTER 4: RESULT AND DISCUSSION.....</b>	<b>34</b>
4.1 INTRODUCTION .....	34
4.2 ANALYSIS ON CURRENT SCHEDULE OF AUXILIARY POLICE .....	34
4.2.1 ANALYSIS OF THE INTERVIEW WITH THE POLICE-IN-CHARGE .....	34
4.2.2 ANALYSIS OF THE PROBLEM IN CURRENT AUXILIARY POLICE SCHEDULING .....	34
4.3 AUXILIARY POLICE SCHEDULING USING GRAPH COLORING .....	36
4.3.1 APPLYING GRAPH COLORING FOR THE SCHEDULING PROBLEM.....	36
4.3.2 AUXILIARY POLICE SCHEDULE USING GRAPH COLORING .....	39
4.4 VALIDATION OF THE RESULT.....	42
4.4.1 COMPARISON OF A MANUAL AND GENERATED SCHEDULE .....	42
4.4.2 RELATIVE ERROR FOR SCHEDULING .....	43
4.5 SUMMARY .....	45
<b>CHAPTER 5: CONCLUSION AND RECOMMENDATION .....</b>	<b>46</b>
5.1 INTRODUCTION .....	46
5.2 CONCLUSION.....	46
5.3 RECOMMENDATION .....	47
<b>REFERENCES.....</b>	<b>48</b>
<b>APPENDIX A .....</b>	<b>52</b>
<b>APPENDIX B .....</b>	<b>54</b>
<b>APPENDIX C .....</b>	<b>55</b>
<b>APPENDIX D .....</b>	<b>57</b>

## **ABSTRACT**

This study is focused on the auxiliary police scheduling system. The rooster, also known as the auxiliary police officer, is frequently the one who makes the schedule. If the schedule is made manually, there is a potential that there won't be enough shift hours. The primary source of the information, which includes the weekly auxiliary police schedule, was one of Malaysia's higher education institutions' auxiliary police units. It is essential to schedule auxiliary police in a systematic way to ensure quality service. The main objective of this study is to analyse the current situation with the auxiliary police work schedule. The second objective is to maximize the total number of working days using the graph colouring method. Every restriction and needs in this university are set forward for the auxiliary police schedule to be considered while developing the model. The whole set of outcomes for the schedule was created using Excel and Python programming software. A graph with 11 vertices presenting 11 police officer for 28 days in Universiti Teknologi Mara was constructed initially. The solution generated from an integer linear programming model, which had assigned groups to a three different shift groups. The result was then used to create the auxiliary police schedule. The proposed schedule is verified by comparing the findings to the timetable provided by the campus auxiliary police. The planned timetable is validated by comparing the obtained results to the manual schedule provided by the campus' auxiliary police. The goal of this study is to test the capability of the graph colouring model in developing the automated auxiliary police schedule and maximizing the total number of working days per schedule to help auxiliary police build schedules that are more effective and highly desired. As a future analysis suggestion, it is proposed to use a timetable software such as Sling software and scheduling problem method such as goal programming and integer linear programming.