



OPTIMUM RESOURCES UTILIZATION FOR MULTI-  
REPETITIVE CONSTRUCTION PROJECTS IN JORDAN

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## Dedication

There are a number of people without whom this thesis might not have been done, and to whom I am greatly indebted.

This thesis is dedicated to my parents for their love, endless support and encouragement. To my father who raise me and bear a lot in order to save my tuition expenses. To my mother who give me the source of power and motivation during the moments of despair and to the endless love and care.

I dedicated this work to my dear husband for practical and emotional support.

**Amani Mohammed Rushdi**

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## Committee Decision

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## Abstract

The objective of our study is to create a mathematical model for multi repetitive projects, then solving it by integer optimization model taking into consideration the available budget and project duration to achieve the maximum profit for each project, then constructing the realistic schedule that fit with different constraints.

The study consists of ten projects and each project has repetitive activities. The difficulties in our study being in collecting information from construction companies about each project, which include the number of units that will be constructed, budget, duration, cost and profit then converting this information into equations.

The mathematical model will be constructed using the available information. The integer linear programming model which contains 57 constraints and 32 variables has been used to solve the mathematical model to get the optimum allocation of financial resources for our case study.

We can conclude from this research that scheduling multi projects with traditional techniques such as Critical Path Method (CPM) or Program Evaluation and Review Technique (PERT) by using the available information will not give the optimum results, but using the mathematical model in combination with the optimization techniques will reduce the cost of constructing projects, increasing the profits and arranging priorities in constructing different projects.

Finally, we recommended to use the mathematical model in combination with the optimization technique in scheduling different projects in construction companies to add the reality in scheduling projects and to get the optimum results.

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## List of Abbreviations

<b>Abbreviations</b>	<b>Description</b>
<b>CPM</b>	Critical Path Method
<b>ISARC</b>	International Symposium on Automation & Robotics in Construction
<b>m</b>	Million
<b>OR</b>	Operation Research
<b>PDM</b>	Precedence Diagramming Method
<b>PERT</b>	Program Evaluation and Review Technique
<b>REPNET</b>	Representative Network