

PROJECT TITLE HERE

EMÜ 405 System Analyses and Design I

FINAL REPORT

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ABSTRACT

Abstract:

Write 100–250 words here.

Key Words: [keyword1; keyword2; keyword3; ...]

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ABBREVIATIONS

- VRP: Vehicle Routing Problem
- VRPSPD: Capacitated Vehicle Routing Problem with Simultaneous Pickup and Delivery
- MILP: Mixed-Integer Linear Programming
- MTZ: Miller–Tucker–Zemlin
- UNSDG: United Nations Sustainable Development Goals

1 INTRODUCTION

Background, motivation, context, and brief report roadmap.

2 LITERATURE REVIEW

Summarize relevant studies; add citations with IEEE style if you use BibTeX later or manual numbering.

3 SCOPE OF THE PROJECT

3.1 Problem Definition

Define the problem clearly.

3.1.1 UNSDG Consideration for Problem Definition

Which UNSDG(s) are relevant and why.

3.2 Objectives of the Study

- Objective 1: ...
- Objective 2: ...
- Objective 3: ...

3.2.1 Real Life Constraints of the Study

- Constraint 1 (e.g., capacity, time window, shift, stop count): ...
- Constraint 2: ...

3.2.2 Ethical Considerations

Fairness, data privacy, workload balance, etc.

3.3 Multidisciplinary Approaches and Interactions

How IE interacts with CS, logistics, operations, etc.

4 METHODOLOGIES

4.1 Problem Formulation / Mathematical Model (MILP)

Insert MILP here.

4.2 Solution Approach

- Solver and version: ...
- Hardware/compute environment: ...
- Time limit / optimality gap: ...

4.3 Experimental Design (Scenarios)

- Scenario 1: ...
- Scenario 2: ...
- Scenario 3: ...

5 ANALYSIS AND RESULTS

5.1 Analysis

Explain methodology of analysis: KPIs, scenario setup, data pipeline, validation checks, etc.

Table 1: Example KPI Summary (replace with your results)

KPI	Scenario 1	Scenario 2	Scenario 3
Total cost			
Urgent backlog (end)			
Normal backlog (end)			
Vehicles used			

5.2 Results

6 DISCUSSIONS

6.1 Study limitations

Limitations: modeling assumptions, data limits, scalability, etc.

6.2 Applicability of the project under real life situations

How/when it can be applied; deployment notes. [1]

6.3 Health and Safety Issues

Operational safety, driver workload, road safety, etc.

6.4 Legal Issues

Data protection, compliance, regulations.

6.5 Economical Issues and Constraints

Costs, budget, ROI, constraints.

6.6 Sustainability

Emissions, efficiency, UN SDGs, etc.

6.7 Producibility-Manufacturability

If relevant; otherwise justify N/A.

6.8 Social and Political Issues

Equity, social impacts, etc.

6.9 Environmental Issues

Environmental impacts, waste, emissions.

6.10 Multidisciplinary Collaboration

Team coordination, cross-discipline contributions.

7 CONCLUSIONS

Conclude with key findings and what they mean.

8 PROJECT PLAN AND FUTURE STUDIES

Remaining tasks, future improvements, and updated Gantt chart.

9 REFERENCES

References

[1] Author, "Title," Journal/Conference, year.

[2] Author, *Book Title*. Publisher, year.

10 APPENDIX

Appendix A: Additional Tables / Figures

Extra material here.

11 references

References

- [1] United Nations, “Sustainable development goals,” <https://sdgs.un.org/goals>, accessed: 2025-12-29.