Department of Mathematics

College of Science

Salahaddin University-Erbil

Subject: Operation Research

Course Book –Year 4

Lecturer's name: Bahar Obed Ali

Academic Year: 2019/2020

Course Book

1. Course name	Operation Research
2. Lecturer in charge	Bahar Obed Ali
3. Department/ College	Mathematics/Science
4. Contact	e-mail :bahar.ali@su.edu.krd
5. Time (in hours) per week	Theory: 2
6. Office hours	
7. Course code	
8. Teacher's academic profile	I am an assistant lecturer of Optimizations Network in Collage of science, Department of mathematics, I am interested in studying the Operation Research, Linear Programming, integer Programming, Assignment Problem, Transportation Problem, Game Theory, Job Sequence, Shortest route, Network flow . In the classroom-based investigations that focus on how the process of noticing students discuss problems in mathematics. I had published research in Optimizations Network in Hungary journals. with the goal of informing students education, curriculum, and professional development programs.
9. Keywords	

10. Course overview:

Operations research (OR) (also called Management Science) has many applications in science, engineering, economics, and industry and thus the ability to solve OR problems are crucial for both researchers and practitioners. Being able to solve the real-life problems and obtaining the right solution requires understanding and modeling the problem correctly and applying appropriate optimization tools and skills to solve the mathematical model.

11. Course objective:

Upon completion of this course, you will be able to:

1) To introduce the students how to use variables for formulating complex mathematical models in

management science, industrial engineering and transportation science.

2) Understand the theoretical workings of the Simplex method for linear programming.

3) Understand the relationship between a linear program and its dual, including strong duality and

complementary slackness.

4) Solve specialized linear programming problems like the transportation and assignment

problems.

5) Understand the applications of, basic methods for, and challenges in integer programming.

6) Understand how to model and solve problems using dynamic programming.

12. Student's obligation

In the classroom, the student participants by discussion the lesson, doing homework and quizzes within the year.

13. Forms of teaching

I used Wight board within the lesson.

14. Assessment scheme

For this year, different assessment measures are considered such as quizzes, graded homework and exams, building up to a comprehensive final exam. The final grade is calculated as follows: Exams: 30%, Homework and interactive activities: 10%, Final Exam: 60%

15. Student learning outcome:

1- The students should know the Linear Programming for problem formulated & solution.
2- The student should be distinguished between the supply and dummy Transportation problem.
3- The student collect knowledge about assignment Problem.
4- A plane strategy for game theory.

16. Course Reading List and References:

Key references:

1) Sharma S. D., **Operation Research**, EAR NATH RAM NATH &CO, 1988.

2) Magazines and review (internet): (mbaii_qt-5pdf)

| 17. The Topics: | Lecturer's name |

1)Linear programming	Introduction to linear programming, Canonical form of LPP, Standard form of LPP , Linear Programming Formulation, Graphical Linear programming, Multiple Optimal, Unbounded, Infeasible Solution. Simplex Method, Simplex Method with More than Two Variables, B.M. Method, Two Phase Method, Multiple, Unbounded, Infeasible Solution.
2) Dual Problem	Dual Problem, Dual Simplex Method
3) Transportation Problem	North- West Corner, Lowest Cost, Penalty Method (Vogel's Approximation Method), Degenerate Transportation , Unbalanced Transportation Problem.
4) Assignment and Travelling Salesman Problem.	Introduction, Assignment Problem, Unbalanced Assignment Problem, Travelling Salesman Problem.
5) Network Problem	Shortest Path Problem, Minimum Spanning tree Problem
6) Project Network	Critical Path Method (CPM), Programming Evaluation and Review Technique (PERT), Earliest and Latest Times.

18. Practical Topics (If there is any)

19. Examinations:

1. Compositional:

Q. Use **North-West Corner Rule** to **find** an **initial basic feasible solution** and **prove** it to be **optimal solution** to the following **transportation problem** for which the cost sources and destination are as given below

	a	b	c	Supply
A	2	7	4	5
B	3	3	1	8
C	5	4	7	7
D	1	6	2	14
Demand	7	9	18	

20. Extra notes:

Here the lecturer shall write any note or comment that is not covered in this template and he/she wishes to enrich the course book with his/her valuable remarks.

21. Peer review
پێداچوونەوەی هاوەڵ

This course book has to be reviewed and signed by a peer. The peer approves the contents

of your course book by writing few sentences in this section.

(A peer is person who has enough knowledge about the subject you are teaching, he/she has to be a professor, assistant professor, a lecturer or an expert in the field of your subject).

ئەم کۆرسبووکە دەبێت لەلایەن هاوەڵێکی ئەکادیمیەوە سەیر بکرێت و ناوەرۆکی بابەتەکانی کۆرسەکە پەسەند بکات و جەند ووشەیەک بنووسێت لەسەر شیاوی ناوەرۆکی کۆرسەکە و واژووی لەسەر بکات.

هاوەڵ ئەو کەسەیە کە زانیاری هەبێت لەسەر کۆرسەکە و دەبێت پلەی زانستی لە مامۆستا کەمتر نەبێت.