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**Syllabus of QUA 515 - Decision Models and Analysis**

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| **Batch: Semester II, 1441** | **Section: 4251** |
| **Number of Sessions: (15 weeks)** | **Credit hours: 2 Credit Hours**  |
| **Course Instructor: Rashid Alhamali** | **E-mail: rkahtani@ksu.edu.sa**  |
| **Office: Building, 67 Floor, 2nd, Office No. S235** | **Website:**  |
| **Office Hours: Mon. 11 -1** | **Lecture Time: Sat.1:00 – 2:50** |

 **Course Objectives:**

This course introduces the basic principles and techniques of applied mathematical modeling for managerial decision-making. Students learn to use some of the more important analytic methods (e.g. spreadsheet modeling, optimization, Monte Carlo simulation), to recognize their assumptions and limitations, and to employ them in decision-making

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| Weeks | Content |
| 1-2 | An Introduction to Decision Making  |
| 3-5 | Problem Formulation and Modeling with LP |
| 6-7 | Graphical Solution of LP  |
| 8-9 | Sensitivity Analysis and Computer Solution (QM)  |
| 10 | Midterm Exam (30 % of total points) |
| 11 | Linear Programming: Modeling Examples |
| 12-13 | Transportation and Assignment Problems |
| 14-15 | Decision Analysis  |

**Text Books Recommended:**

**1-**Bernard W. Taylor**, Introduction to Management Science.** Global Edition 13/E, Pearson 2019.

**2-** Hamdy A. Taha**, Operations Research: an introduction,** Tenth Edition**,** Pearson Education Limited 2017.

**Schedule of Assessment Tasks for Students During the Semester**

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| Assessment task (eg. essay, test, group project, examination etc.) | Week due | Proportion of Final Assessment |
| Midterm  | 10 | 30% |
| Assignments and Case Studies  |  | 30% |
| Final Exam |  | 40% |

**Course learning outcomes:**

1. **Knowledge**
* Define Basic concepts of linear programming and its applications.
1. **Cognitive Skills**
* Explain the steps involved in formulation of LP model.
* Explain the steps involved in formulation of Transportation Problem.
* Explain the steps involved in solving the LP problem graphically and using Simplex Method.
* Explain the concepts of Sensitivity Analysis and Duality.
1. **Interpersonal Skills & Responsibility**
* Demonstrate the application of the LP models in solving management problems.
1. **Communication, Information Technology, Numerical**
* Demonstrate the application using computer software.