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**Department of Water Resource Engineering**

**College of Engineering**

**University of Salahaddin**

**Subject: 6130Water Resources Management**

**Lecturer: Ass. Prof. Dr. Jehan M. Sheikh Suleimany**

**Bologna System Academic Year 2021/2022**

**Course Book**

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| **1. Course name** | **Water resources management** |
| **2. Lecturer in charge** | **Ass. Prof. Dr.Jehan Sheikh Suleimany** |
| **3. Department/ College** | **Water Resource engineering department/college of engineering** |
| **4. Contact** | **e-mail:** **jehan\_fattah@yahoo.com****,** **jehanmohammed.sheikhsuleimany@us.edu.krd****Tel: 07513042595** |
| **5. Time (in hours) per week**  | **For example Theory: 3****Practical:**  |
| **6. Office hours** | **2 hours/week** |
| **7. Course code** | **6130** |
| **8. Teacher's academic profile**  | **More than 25 years' experience in teaching different subjects** |
| **9. Keywords** | **Linear programing ,graphical method, non linear programig** |
| **10. Course overview:** * Water Resources Systems; Systems Analysis Techniques; Optimization.
* Conditions of LP Problem; Graphical Method; Simplex Method; dual method
* Introduction; Transportation Algorithm; Northwest-corner Method; Least-cost Method; Vogel Approximation Method; Balancing the Transportation Model;
* Introduction; NLP without Constraints; NLP with Equality Constraints; NLP with Equality and Non-equality Constraints; LaGrange multiplier, Mbig method
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| **11. Course objective:**On successful completion of this course, students will be able to:1. Apply mathematical approaches for managing water resources systems.2. Understand integrated planning of water resources projects.3. Solve engineering problems in operations research using LP, and NLP.4. Use computer software to solve optimization problems. |
| **12. Student's obligation**Students should perform one midterm exams and one final exam and to submit group work assignments represented by a report on design of a barrage completely, conducting short quizzes and they should attend the classes regularly |
| **13. Forms of teaching**The teaching material will be handover to the students as a hard and soft copy in advance.Then, the classes will be delivered as PowerPoint presentation and examples will be illustrated in class. |
| **14. Assessment scheme**Course works (groups) ,exams, quizzes, assignments 40/40Final Exam 60/100‌ |
| **15. Student learning outcome:**Upon successful completion of this course, the student will be able toThis course enables students to achieve, by the time of graduation:* An ability to apply knowledge of mathematics, science, and engineering.
* An ability to identify, formulates, and solves engineering problems.
* The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context.
* an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice
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| **16. Course Reading List and References‌:**Water Resources Systems and Management, 2008, by B. L. Gupta and Amit Gupta, 2nd editions standard publishers’ distributors, Delhi.Linear Programming and network flows, 2010, by Mokhtar, S. Bazaraa, 3rd edition, John Wiley& Sons, Inc.Linear and non-linear programming, 2008, by Yinyu Ye, Springer. |
| **17. The Topics:** | **Lecturer's name** |
| 1. Linear programming by graphical method and simplex method with applications.
2. Nonstandard linear programming Dual method
3. Non linear programing with applications
 | Lecturer's nameJehan SheikhSuleimany |
| **18. Practical Topics (If there is any)** |  |
| Server and mat lab programs  | Lecturer's nameJehan Sheikh Suleimany |
| **19. Examinations:*****1-****Solve the nonlinear programing problem using lagrange multiplier method**2- solve standard maximization problem using simplex method**3-solve non standard minimization leaner programing using dual method* |
| **20. Extra notes:** |
| **21. Peer review پێداچوونه‌وه‌ی هاوه‌ڵ** 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).*ئه‌م کۆرسبووکه‌ ده‌بێت له‌لایه‌ن هاوه‌ڵێکی ئه‌کادیمیه‌وه‌ سه‌یر بکرێت و ناوه‌ڕۆکی بابه‌ته‌کانی کۆرسه‌که‌ په‌سه‌ند بکات و جه‌ند ووشه‌یه‌ک بنووسێت له‌سه‌ر شیاوی ناوه‌ڕۆکی کۆرسه‌که و واژووی له‌سه‌ر بکات.هاوه‌ڵ ئه‌و که‌سه‌یه‌ که‌ زانیاری هه‌بێت له‌سه‌ر کۆرسه‌که‌ و ده‌بیت پله‌ی زانستی له‌ مامۆستا که‌متر نه‌بێت.‌‌  |