

Sub.	Course Description – توصيف مقرر دراسي	الموضوع	 <b>كليات المعرفة</b> ALMAAREFA COLLEGES
Date		التاريخ	

Course Code & No	IE322		رقم المقرر ورمزه
Course Name	Industrial Operations Research -2-		اسم المقرر
Credit Hours	3 (3+1+1)		عدد الساعات المعتمدة
Pre-requisite	IE 321		المتطلب السابق

<b>General Description</b>	توصيف عام
Deterministic dynamic programming; Forward and backward procedures; Integer programming; Branch and Bound methods; Nonlinear programming; Single and multi-variable unconstrained optimization; KKT conditions and quadratic programming; Markov chains; Queuing Theory.	

<b>Course Objectives</b>	أهداف المقرر
The course aims to introduce the students with more deterministic and stochastic models for solving industrial problems in production systems.	
<b>By the end of the course, each student should be able to</b>	
<ul style="list-style-type: none"> <li>• Model and formulate of production system problems using integer, dynamic and nonlinear programs.</li> <li>• Model and formulate of production system problems using stochastic models, particularly of Markov chains, and queuing problems and their solutions methods</li> <li>• Analyze and solve huge amount of data of large real life industrial problems</li> </ul>	

<b>Course Outlines</b>	مفردات المقرر
<ul style="list-style-type: none"> <li>• Integer programming: Formulations and industrial applications</li> <li>• Solution methodologies: Branch and Bound method</li> <li>• Dynamic programming: Characteristics of dynamic programs</li> <li>• Forward and backward procedures</li> <li>• Nonlinear programming: Unconstrained programming (Direct search methods and Gradient Method); Constrained programming (Separable programming, Linear combination method)</li> <li>• Discrete time Markov chains: Markov chains-Basic concepts; Steady state distribution in Markov chains &amp; applications</li> <li>• Queuing Models: Markovian Models with single servers; Markovian models with multiple servers; Models with limited capacities; Queuing decision models</li> </ul>	

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References	المراجع
<p><b>Required Textbooks</b>  Operations Research: An introduction, 9th Ed., H. A. Taha, Prentice Hall, latest edition.</p> <p><b>Essential References Materials</b></p> <ul style="list-style-type: none"> <li>• Introduction to Operations Research, 8th Ed., Hillier and Lieberman, McGraw Hill, latest edition.</li> <li>• Introduction to operations research, Frederick S. Hillier and Gerald J. Lieberman, McGraw-Hill.</li> </ul>	