

<b>Module Code</b>	<b>MA4022</b>	<b>Title</b>	<b>Operational Research</b>			
<b>Credits</b>	<b>03</b>	<b>Hours/Week</b>	<b>Lectures</b>	<b>02</b>	<b>Pre-requisites</b>	MA1012
			<b>Lab/Tutorials</b>	<b>-</b>		

**Learning Objectives**

- Use quantitative methods, techniques and tools in solving problems in the real world
- Acquire the Skills to improve the effectiveness of the system as whole with emphasis on allocation of scarce resources
- Acquire skills of Modeling in various decision problems
- Use various methods of solution applied in different OR Models
- Use OR models as Decision Support System (DSS) Tools in different areas.
- Apply appropriate OR Techniques, which could be used in developing computer oriented DSS.
- Integrate OR models with information technology to developed effective DSS

**Learning Outcomes**

- To apply appropriate OR techniques in a given real world problem.
- To perform sensitivity analysis in the chosen OR model.
- To choose appropriate algorithm given the OR technique.
- Usage of specific and generic software.

**Outline Syllabus**

Modeling with linear programming, geometrical solution to problems with two decision variables, the simplex method including the two phase method of a solution of problems with mixed constraints. Duality. Transpiration and Assignment problems. Theory of zero sum, two person matrix games.

Revised simplex algorithm. Dual Simplex algorithm, sensitivity analysis and parametric programming. Integer programming, Gomory's cutting plane, branch and bound, the knapsack problem. .Dynamic programming, the inventory model. Non-linear optimization. Introduction to network algorithm including minimum connector problems: Shortest and longest path algorithms and critical path analysis.