Module: Linear Programming 281

Module name:	Linear Programming 281
Code:	LPR281
NQF level:	6
Type:	Core – Bachelor of Computing (all streams)
Contact time:	48 hours
Structured time:	8 hours
Self-directed time:	54 hours
Notional hours:	110 hours
Credits:	11
Prerequisites:	LPR181,MAT181

Purpose

Linear Programming is a scientific approach to decision making that seeks to best design and operate a system, under conditions requiring the allocation of scarce resources. It is an interdisciplinary mathematical science that focuses on the effective use of technology by organisations. In contrast, many other science and engineering disciplines focus on technology, giving secondary considerations to its use.

Outcomes

Upon successful completion of this module, the student will be able to:

- Demonstrate detailed knowledge of the main areas of linear programming, including an understanding of and the ability to apply the key terms, concepts, facts, principles, rules and theories of linear programming to unfamiliar but relevant contexts; and knowledge of an area or areas of specialisation and how that knowledge relates to other fields, disciplines or practices.
- Show an understanding of different forms of knowledge, schools of thought and forms of explanation within linear programming, and awareness of knowledge production processes.
- Evaluate, select and apply appropriate methods, procedures or techniques in investigation or application processes within a defined context.
- Identify, analyse and solve problems in unfamiliar contexts, gathering evidence and applying solutions based on evidence and procedures appropriate to linear programming.
- Evaluate different sources of information, to select information appropriate to the task, and to apply well-developed processes of analysis, synthesis and evaluation to that information.
- Make decisions and act appropriately in familiar and new contexts, demonstrating an understanding of the relationships between systems, and of how actions, ideas or developments in one system impact on other systems.

Assessment

Assessment is performed using a variety of instruments:

- Continuous evaluation of theoretical work through written assignment, formative, and summative test.
- Final assessment through a written examination.

- The assignments or projects collectively will count 20% of your class mark.
- All tests will collectively account for 80% of your class mark.
- Your class mark contributes 30% towards your final mark for the subject, while the final assessment accounts for 70% of your final mark.

Teaching and Learning

Learning materials

Prescribed Book

Prescribed Book (EBSCO)

- 🕮 Wayne L. Winston. 2004. Operations Research - Applications and Algorithms. Fourth Edition. ISBN 0-534-52020-0.

Additional Material

- 🕮 Hamdy A. Taha. 2007. Operations Research - An Introduction. Eigth Edition. ISBN 0-13-188923-0.
- 🕮 Frederick S. Hillier. 2010. Introduction to Operations Research. Ninth Edition. ISBN 978-9814577205.
- 🕮 Frederick S. Hillier. 2010. Introduction to Operations Research. Seventh Edition. ISBN 978-9814577205.

Learning activities

The teaching and learning activities consist of a combination of formal lectures on theoretical concepts, exercises and discussions. Three mandatory assignments must be completed during the course. The experiences and progress on these practical components form the content of class discussions.

Notional learning hours

Activity	Units	Contact Time	Structured Time	Self-Directed Time
Lecture		40.0		21.0
Formative feedback		8.0		
Project				
Assignment	3			9.0
Test	3		6.0	11.0
Exam	1		2.0	13.0
		48.0	**8.0**	**54.0**

Syllabus

- Goal Programming
- Sensitivity Analysis
- Dual theorem
- Shadow Prices
- Dual Simplex Method