

**Hong Kong Baptist University**  
**Faculty of Science**  
**Department of Mathematics**

**Title (Units):** ORBS7160 Network and Project Management (3,3,0)

**Course Aims:** This course introduces the fundamental idea, techniques and algorithms for network, transportation, and assignment models, as well as project management.

**Prerequisite:** No

**Prepared by:** Yau Chin Ko

**Remark:** This course is delivered by staff of HKBU.

**Course Intended Learning Outcomes (CILOs):**

Upon successful completion of this course, students should be able to:

No.	Course Intended Learning Outcomes (CILOs)
1	Explain the fundamental principles of network and transportation models
2	Apply appropriate algorithms to solve a given network problem
3	Formulate real-life transportation and assignment problems as mathematical programming problems
4	Apply network models to project management

**Teaching & Learning Activities (TLAs):**

CILO	TLAs will include the following:
1,2,3,4	Lectures with rigorous mathematical discussions and concrete examples. The lecturer will constantly ask questions in class to make sure that the majority of students are following the teaching materials.
1,2,3,4	Assignments to monitor both students' learning and mastering of the taught materials. In addition, common mistakes will also be addressed and analyzed.

**Assessment:**

No.	Assessment Methods	Weighting	CILO Addressed	Remarks
1	Assignments	40%	all	Assignments are designed to measure students' understanding of the theory, techniques, and applications of network and project management. Assignments are conducted to monitor the students' understanding of the theory, techniques and skills taught in the class. This may involve, but not limited to, in-class discussions of rigorous technical problems and their solutions.
2	Final Examination	60%	1,2,4	Final Examination is designed to see how far students have achieved their intended learning outcomes especially in the knowledge domain. Students should have a thorough understanding of the knowledge and apply them correctly in different context to do well in the exam.

## Course Intended Learning Outcomes and Weighting:

Content	CILO No.	Teaching (in hours)
1. Network Models	1,2,3	13
2. Transportation and Assignment Models	1,2,3	13
3. Project Management	2,4	13

## References:

1. F. S. Hillier and G. J. Lieberman, *Introduction to Operations Research*, McGraw Hill 2005, eighth edition.
2. H. A. Taha, *Operations Research, an introduction*, Prentice Hall, 2010, ninth edition.
3. W. L. Winston, *Operations Research: applications and algorithms*, Thomson Brooks/Cole, 2004, fourth edition.

## Course Content in Outline:

<u>Topic</u>	<u>Hours</u>
1. Network Models	13
A. Shortest route problems	
B. Minimum spanning tree problem	
C. Maximum flow problems	
2. Transportation and Assignment Models	13
A. Transportation problems	
B. Transportation simplex methods	
C. Assignment problems	
D. Hungarian algorithm	
3. Project Management	13
A. Critical Path Method	
B. Time-cost trade-off	
C. Project Evaluation and Review Techniques	

(Approved by the Science Faculty Board Meeting 31 October 2023)

(Approved by the Department Management Committee on 5 September 2023)