Unit study package code: INDE2000
Mode of study: Internal
Tuition pattern summary: Note: For any specific variations to this tuition pattern and for precise information refer to the Learning Activities section.
Lecture: 1 x 2 Hours Weekly
Tutorial: 1 x 1 Hours Weekly
Workshop: 1 x 1 Hours Weekly
This unit does not have a fieldwork component.
Credit Value: 25.0
Pre-requisite units: Nil
Co-requisite units: Nil
Anti-requisite units: Nil
Result type: Grade/Mark
Approved incidental fees: Information about approved incidental fees can be obtained from our website. Visit fees.curtin.edu.au/incidental_fees.cfm for details.
Unit coordinator:

Title: Associate Professor
Name: Benchawan Wiwatanapataphee
Phone: 08 92662405
Email: B.Wiwatanapataphee@curtin.edu.au
Location: Building: 314 - Room: 453

Teaching Staff:

Name: Benchawan Wiwatanapataphee
Phone: 08 92662405
Email: b.wiwatanapataphee@curtin.edu.au
Location: Building: 314 - Room: 453

Administrative contact:

Name: Benchawan Wiwatanapataphee
Phone: 08 92662405
Email: B.Wiwatanapataphee@curtin.edu.au
Location: Building: 314 - Room: 453
Acknowledgement of Country

We respectfully acknowledge the Indigenous Elders, custodians, their descendants and kin of this land past and present.

Syllabus

This unit introduces key concepts and activities in the areas of logistics and supply chain management and establishes the distinct role each plays in industrial modelling and optimisation. Basic skills in analysing, classifying and solving the fundamental components of inventory systems are developed using both single and multi-commodity deterministic and stochastic models. Forecasting techniques and practices are introduced. Case studies are used to highlight and expand the understanding and application of the topics discussed in the unit.

Introduction

On successful completion of this unit, student will be able to

- Evaluate the role and significance of logistics and supply chain modelling to our world;
- Explain key concepts of inventory systems;
- Analyse inventory models for both single and multi-commodity systems with deterministic and stochastic demands;
- Evaluate forecasting requirements in industry and the ability to apply forecasting techniques to determine long term, medium term and short term forecasts;
- Apply and adapt models to industrial situations.

Unit Learning Outcomes

All graduates of Curtin University achieve a set of nine graduate attributes during their course of study. These tell an employer that, through your studies, you have acquired discipline knowledge and a range of other skills and attributes which employers say would be useful in a professional setting. Each unit in your course addresses the graduate attributes through a clearly identified set of learning outcomes. They form a vital part in the process referred to as assurance of learning. The learning outcomes tell you what you are expected to know, understand or be able to do in order to be successful in this unit. Each assessment for this unit is carefully designed to test your achievement of one or more of the unit learning outcomes. On successfully completing all of the assessments you will have achieved all of these learning outcomes.

Your course has been designed so that on graduating we can say you will have achieved all of Curtin’s Graduate Attributes through the assurance of learning process in each unit.

<table>
<thead>
<tr>
<th>On successful completion of this unit students can:</th>
<th>Graduate Attributes addressed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evaluate the role and significance of logistics and supply chain modelling to our world</td>
<td>![Email Icon]</td>
</tr>
<tr>
<td>Explain key concepts of inventory systems</td>
<td>![Phone Icon] ![Email Icon]</td>
</tr>
<tr>
<td>Analyse inventory models for both single and multi-commodity systems with deterministic and stochastic demands</td>
<td>![Phone Icon] ![Email Icon]</td>
</tr>
<tr>
<td>Evaluate forecasting requirements in industry and the ability to apply forecasting techniques to determine long term, medium term and short term forecasts</td>
<td>![Phone Icon] ![Email Icon] ![Video Icon]</td>
</tr>
<tr>
<td>Apply and adapt models to industrial situations</td>
<td>![Video Icon] ![Phone Icon] ![Email Icon]</td>
</tr>
</tbody>
</table>
Curtin’s Graduate Attributes

<table>
<thead>
<tr>
<th>Apply discipline knowledge</th>
<th>Thinking skills</th>
<th>Information skills</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(use analytical skills to solve problems)</td>
<td>(confidence to investigate new ideas)</td>
</tr>
<tr>
<td>Communication skills</td>
<td>Technology skills</td>
<td>Learning how to learn</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(apply principles learnt to new situations)</td>
</tr>
<tr>
<td>International perspective</td>
<td>Cultural understanding</td>
<td>Professional Skills</td>
</tr>
<tr>
<td>(value the perspectives of others)</td>
<td>(value the perspectives of others)</td>
<td>(work independently and as a team)</td>
</tr>
</tbody>
</table>

Find out more about Curtin’s Graduate attributes at the Office of Teaching & Learning website: ectl.curtin.edu.au

Learning Activities

Students are advised to attend a two-hour lecture, a one-hour workshop, and a one-hour computer lab every week.

This unit composes of three parts as follows.

**Part 1:** Logistics/Supply Chain management and Designing the Supply Chain Network

- Concepts and Roles of Logistics/Supply Chain Management
- Network design in the Logistics/Supply Chain, and in Uncertain environment with case studies
- Fundamentals of Optimization Models: Linear Programming

**Part 2:** Inventory models

- Simple Inventory System;
- Inventory Models with Variation-Quantity Discount Models; Multi-Commodity EOQ Models;
- Stochastic Inventory Models – Single Period / Single Commodity Models; Multi Period Models with no Shortages wand with Shortage;
- Modelling and Optimization in Warehousing Logistics – Warehouse Designs, Production Allocation, Operational Decisions

**Part 3:** Forecasting technique

- Introduction to Forecasting: Qualitative and Quantitative methods;
- Quantitative Methods – Casual methods; Time series Extrapolation: Constant Process, Linear trend model, Quadratic trend model, Cyclic variation;
- Quantitative Methods – Regression methods; Moving Average methods/Double Moving Average; Exponential Smoothing method/Double Exponential Smoothing methods, Winter’s method;
- Error Analysis of Forecasting

**Learning Resources**

**Recommended texts**

You do not have to purchase the following textbooks but you may like to refer to them.

- Supply Chain Management - Strategy, Planning and Operation (5th Ed.) by Sunil Chopra and Peter Meindl
  2004, Prentice Hall.
  (ISBN/ISSN: 978-0132743952)
Assessment

Assessment schedule

<table>
<thead>
<tr>
<th>Task</th>
<th>Value %</th>
<th>Date Due</th>
<th>Unit Learning Outcome(s) Assessed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assignment 1</td>
<td>15 percent</td>
<td>Week: Week 6, Day: 8th April 2016, Time: 6.00 pm</td>
<td>1,2,3</td>
</tr>
<tr>
<td>Assignment 2</td>
<td>15 percent</td>
<td>Week: Week 11, Day: 13 May 2016, Time: 6.00 pm</td>
<td>1,2,3,4,5</td>
</tr>
<tr>
<td>Mid-Semester Test</td>
<td>20 percent</td>
<td>Week: Week 9, Day: 26 April 2016, Time: 3.00-5.00 pm</td>
<td>1,2,3</td>
</tr>
<tr>
<td>Final Examination</td>
<td>50 percent</td>
<td>Week: Week 16, Day: 14 June 2016, Time: 3.00-5.00 pm</td>
<td>1,2,3,4,5</td>
</tr>
</tbody>
</table>

Detailed information on assessment tasks

1. Assignment 1
2. Assignment 2
3. Midterm Examination
4. Final Examination

Pass requirements

Students must achieve a Final Mark of 50 or greater to pass this unit.

Fair assessment through moderation

Moderation describes a quality assurance process to ensure that assessments are appropriate to the learning outcomes, and that student work is evaluated consistently by assessors. Minimum standards for the moderation of assessment are described in the Assessment and Student Progression Manual, available from policies.curtin.edu.au/policies/teachingandlearning.cfm

Late assessment policy

This ensures that the requirements for submission of assignments and other work to be assessed are fair, transparent, equitable, and that penalties are consistently applied.

1. All assessments students are required to submit will have a due date and time specified on this Unit Outline.
2. Late submission of assessments is not accepted in this unit. Students will receive a zero mark for any assessment item submitted late.

Assessment extension

A student unable to complete an assessment task by/on the original published date/time (eg examinations, tests) or due date/time (eg assignments) must apply for an assessment extension using the Assessment Extension form (available from the Forms page at students.curtin.edu.au/administration/) as prescribed by the Academic Registrar. It is the responsibility of the student to demonstrate and provide evidence for exceptional circumstances beyond the student’s control that prevent them from completing/submitting the assessment task.

The student will be expected to lodge the form and supporting documentation with the unit coordinator before the assessment date/time or due date/time. An application may be accepted up to five working days after the date or
due date of the assessment task where the student is able to provide an acceptable explanation as to why he or she was not able to submit the application prior to the assessment date. An application for an assessment extension will not be accepted after the date of the Board of Examiners’ meeting.

Deferred assessments
If your results show that you have been granted a deferred assessment you should immediately check your OASIS email for details.

Supplementary assessments
Supplementary assessments are not available in this unit.

Referencing style
The referencing style for this unit is Chicago.

More information can be found on this style from the Library web site: http://libguides.library.curtin.edu.au/referencing.

Copyright
© Curtin University. The course material for this unit is provided to you for your own research and study only. It is subject to copyright. It is a copyright infringement to make this material available on third party websites.

Academic Integrity (including plagiarism and cheating)
Any conduct by a student that is dishonest or unfair in connection with any academic work is considered to be academic misconduct. Plagiarism and cheating are serious offences that will be investigated and may result in penalties such as reduced or zero grades, annulled units or even termination from the course.

Plagiarism occurs when work or property of another person is presented as one’s own, without appropriate acknowledgement or referencing. Submitting work which has been produced by someone else (e.g. allowing or contracting another person to do the work for which you claim authorship) is also plagiarism. Submitted work is subjected to a plagiarism detection process, which may include the use of text matching systems or interviews with students to determine authorship.

Cheating includes (but is not limited to) asking or paying someone to complete an assessment task for you or any use of unauthorised materials or assistance during an examination or test.

From Semester 1, 2016, all incoming coursework students are required to complete Curtin’s Academic Integrity Program (AIP). If a student does not pass the program by the end of their first study period of enrolment at Curtin, their marks will be withheld until they pass. More information about the AIP can be found at: https://academicintegrity.curtin.edu.au/students/AIP.cfm

Refer to the Academic Integrity tab in Blackboard or academicintegrity.curtin.edu.au for more information, including student guidelines for avoiding plagiarism.

Information and Communications Technology (ICT) Expectations
Curtin students are expected to have reliable internet access in order to connect to OASIS email and learning systems such as Blackboard and Library Services.

You may also require a computer or mobile device for preparing and submitting your work.

For general ICT assistance, in the first instance please contact OASIS Student Support: oasisapps.curtin.edu.au/help/general/support.cfm

For specific assistance with any of the items listed below, please contact The Learning Centre: life.curtin.edu.au/learning-support/learning_centre.htm

- Using Blackboard, the I Drive and Back-Up files
- Introduction to PowerPoint, Word and Excel
Additional information

Enrolment

It is your responsibility to ensure that your enrolment is correct - you can check your enrolment through the eStudent option on OASIS, where you can also print an Enrolment Advice.

Student Rights and Responsibilities

It is the responsibility of every student to be aware of all relevant legislation, policies and procedures relating to their rights and responsibilities as a student. These include:

- the Student Charter
- the University's Guiding Ethical Principles
- the University's policy and statements on plagiarism and academic integrity
- copyright principles and responsibilities
- the University's policies on appropriate use of software and computer facilities

Information on all these things is available through the University's "Student Rights and Responsibilities" website at: students.curtin.edu.au/rights.

Student Equity

There are a number of factors that might disadvantage some students from participating in their studies or assessments to the best of their ability, under standard conditions. These factors may include a disability or medical condition (e.g. mental illness, chronic illness, physical or sensory disability, learning disability), significant family responsibilities, pregnancy, religious practices, living in a remote location or another reason. If you believe you may be unfairly disadvantaged on these or other grounds please contact Student Equity at eesj@curtin.edu.au or go to http://eesj.curtin.edu.au/student_equity/index.cfm for more information.

You can also contact Counselling and Disability services: http://www.disability.curtin.edu.au or the Multi-faith services: http://life.curtin.edu.au/health-and-wellbeing/about_multifaith_services.htm for further information.

It is important to note that the staff of the university may not be able to meet your needs if they are not informed of your individual circumstances so please get in touch with the appropriate service if you require assistance. For general wellbeing concerns or advice please contact Curtin's Student Wellbeing Advisory Service at: http://life.curtin.edu.au/health-and-wellbeing/student_wellbeing_service.htm

Recent unit changes

Students are encouraged to provide unit feedback through eVALUate, Curtin’s online student feedback system. For more information about eVALUate, please refer to evaluate.curtin.edu.au/info/.

To view previous student feedback about this unit, search for the Unit Summary Report at https://evaluate.curtin.edu.au/student/unit_search.cfm. See https://evaluate.curtin.edu.au/info/dates.cfm to find out when you can eVALUate this unit.

Recent changes to this unit include:

1. Tuition pattern: a 2-hour lecture, a one-hour workshop, and a one-hour computer lab.
2. Learning resources: only one text book is recommended.
3. Program calendar: Additional topics in linearly and nonlineary contrained optimisation.
<table>
<thead>
<tr>
<th>WK</th>
<th>Topic</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Concept of Supply Chain /Supply Chain Management</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Introduction of Optimization</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Linearly Constrained Optimization</td>
<td>Assignment 1</td>
</tr>
<tr>
<td>3</td>
<td>Nonlinearly Constrained Optimization</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Logistic/Supply Chain Decisions and Management</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>TUITION FREE WEEK</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Simple Inventory; Inventory Models with Variation: 1) Quantity Discount Models 2) Multi-Commodity EOQ models</td>
<td>Due date for assignment 1</td>
</tr>
<tr>
<td>7</td>
<td>Stochastic Inventory models: 1) Single period/Single commodity models 2) Multi period models with no shortage and with shortage</td>
<td>Assignment 2</td>
</tr>
<tr>
<td>8</td>
<td>TUITION FREE WEEK</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>MIDTERM EXAMINATION(20%)</td>
<td>26\textsuperscript{th} April 2016</td>
</tr>
<tr>
<td>10</td>
<td>Mathematical Model and Optimisation in Warehousing Logistics :: 1) Warehouse designs 2) Product allocation 3) Operational decisions</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Introduction to Forecasting: Quantitative and Quantitative methods</td>
<td>Due date for assignment 2</td>
</tr>
<tr>
<td>12</td>
<td>Forecasting Method: 1) Casual Method 2) Time series extrapolation: constant process, linear trend model, Quadratic trend model, cyclic variation.</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Forecasting methods: Regression methods, moving average methods/double moving average</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Forecasting methods: exponential smoothing methods/double exponential smoothing methods Winter’s method; Error analysis of forecasting</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>STUDY WEEK</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>FINAL EXAMINATION</td>
<td>In the 3rd or 4th week of June</td>
</tr>
</tbody>
</table>