THE HONG KONG POLYTECHNIC UNIVERSITY
香港理工大學

DEPARTMENT OF INDUSTRIAL AND SYSTEMS ENGINEERING

MASTER OF SCIENCE

IN

INDUSTRIAL LOGISTICS SYSTEMS

Mode of Study: Full-time / Part-time

Programme Code: 45089

DEFINITIVE PROGRAMME DOCUMENT

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This Definitive Programme Document is subject to review and changes which the programme offering Faculty/Department may decide to make from time to time. Students will be informed of the changes as and when appropriate.

SECTION 1 - INTRODUCTION

BACKGROUND

1.1 Most manufacturing companies in Hong Kong are dispersing their production activities in Mainland China and outsourcing parts and components from overseas. The business success very much depends on their ability in dissecting the value chain and in coordinating the relevant partners to serve the customers. The way of conducting business in Hong Kong is becoming borderless as measured by national boundaries. The use of information technology to enable logistics planning of activities has been an important factor to sustain competitive advantage. The proportion of service activities in this manufacturing value chain has been increasing. As substantial part of Hong Kong's service industry is manufacturing-related and Hong Kong has emerged as a major control, support and coordinating centre for production operations in the region.

HONG KONG'S CHANGING MANUFACTURING ENVIRONMENT

1.2 Since the eighties, Hong Kong's manufacturing industry has enlarged their production capacity by expanding and opening more factories in China and other countries. Accordingly, the manufacturing activities of Hong Kong companies have increased rapidly. These activities can be reflected by the spectacular increases in Hong Kong's outward processing trade with China and other countries over the past few years. Hong Kong has now become a regional base for the management of these manufacturing activities. This includes product design, sourcing of materials & components, mould & tool making, production management, quality control, logistics & supply, technical support, research, design and development, etc.

EVIDENCE OF INDUSTRIAL NEEDS IN INDUSTRIAL LOGISTICS SYSTEMS

1.3 Over the past years, Hong Kong's manufacturing companies have shifted their production and assembly lines to the Mainland, while treating Hong Kong as a regional control centre for managing a dispersed production network for the above mentioned activities. The service sector of Hong Kong's economy is thus heavily linked to manufacturing activities, which is actually flourishing instead of declining.

1.4 As a prominent exporter of manufacturing products, Hong Kong has generated a series of approaches for both safeguarding and improving its competitive position in its major markets. These may be summarized into two distinctive categories (1) upgrading products by adding value, for example, by means of advanced technology, innovative design & marketing processes and product integrity and (2) manufacturing offshore, with provision of services from the territory, in order to take advantage of lower costs.

1.5 For companies operating production facilities offshore, it is recognized that low labour and land rates may not necessarily result in a low cost. One of the major obstacles that have been found in many companies operating offshore is the coordination of the various functions in an organization. How customer needs can be interpreted clearly and taken into consideration by all people concerned, particularly in situations where manufacturing is carried out in plants located in countries away from the head office and of a different culture is another important issue that needs to be addressed. It is further recognized that there are a series of units in the value-creation chain that can be broken at any point by one party or person failing to meet requirements. It becomes clear that a holistic or total approach to value-creation has to be adopted and this should be increasingly interpreted from a regional perspective.

1.6 The advance in communication technology and transportation has gradually broken regional borders. Global manufacturing refers to the distribution of up-stream and down-stream production activities (ranging from material sourcing, product development, production assembly and product distribution) in different regions with different comparative advantages through coordination and strategic alliances within and amongst enterprises. In other words, companies are now establishing their production bases wherever human resources, technology or markets are available so as to make the best use of resources of a local area. This mode of production method of global coordination and integration not only increases the competitiveness of products in the market, but also raises the response rate of enterprises towards market signals. To this end, an integrated approach to manage the logistics planning and operations on a global basis is crucial.

SECTION 2 – PROGRAMME AIMS AND INTENDED LEARNING OUTCOMES OF THE PROGRAMME

UNIVERSITY MISSION

2.1 The design of this programme begins with the Mission Statement for the University stated below:

(i) To nurture graduates who are critical thinkers, effective communicators, innovative problem solvers, lifelong learners and ethical leaders.

(ii) To advance knowledge and the frontiers of technology to meet the changing needs of society.

(iii) To support a University community in which all members can excel through education and scholarship.

RATIONALE AND PROGRAMME AIMS

2.2 The programme is designed for engineering graduates and professionals who are working in logistics industry and related service sectors. The specific aims are:

(a) To provide students with the use of information technology and managerial approaches in improving inbound logistics, production and outbound logistics so as to create value for the customer.

(b) To provide an opportunity for professional engineers who graduated from other engineering disciplines, to obtain additional expertise in the planning, organizing, staffing, training, assessing, reporting, monitoring, coordinating and controlling of information and other resources involved in the production of goods and services and delighting the customers.

(c) To develop a student's creative and problem solving knowledge and skills appropriate for the management of information and use of knowledge in systems engineering for logistics planning and control.

2.3 RELATIONSHIP BETWEEN UNIVERSITY MISSION AND THE PROGRAMME AIMS

		UNIVERSITY MISSION ELEMENTS		
		(i)	(ii)	(iii)
PROGRAMME AIMS	(a)	X	X	
	(b)	X	X	X
	(c)	X		X

INSTITUTIONAL LEARNING OUTCOMES

2.4 The following learning outcomes are to be broadly applicable to all taught postgraduate programmes:

a. **Professional competence of specialists/leaders of a discipline/profession**: Graduates of PolyU taught postgraduate programmes will possess in-depth knowledge and skills in their area of study and be able to apply their knowledge and contribute to professional leadership.

b. **Strategic thinking:** Graduates of PolyU taught postgraduate programmes will be able to think holistically and analytically in dealing with complex problems and situations pertinent to their professional practice. They will be versatile problem solvers with good mastery of critical and creative thinking skills, who can generate practical and innovative solutions.

c. **Lifelong learning capability:** Graduates of PolyU taught postgraduate programmes will have an enhanced capability for continual professional development through inquiry and reflection on professional practice.

INTENDED LEARNING OUTCOMES (ILOs) OF THE PROGRAMME

2.5 The programme provides an opportunity for students with diverse background to acquire knowledge in the logistics area to fulfill their professional requirements. In general, the learning outcomes for the graduates of MSc/PgD in Industrial Logistics Systems are:

a. **Professional knowledge:** Graduates from the programme will possess professional knowledge and skills in the logistics area. They will be able to apply their professional knowledge learned from this programme to their future working areas (Item b of 2.2 above);

b. **Competence of specialists:** Graduates will have their professional competence in the logistics area. They will be ready to play a leadership role in their field of practice (Item a of 2.2 above);

c. **Systems thinking:** Graduates will be able to think holistically in dealing with complex problems and situations pertinent to their professional practice (Item c of 2.2 above);

d. **Lifelong learning capability:** Graduates will be able to recognize the need for, and engage in lifelong learning (Item c of 2.2 above).

2.6 RELATIONSHIP BETWEEN INSTITUTIONAL LEARNING OUTCOMES AND ILOs OF THE POGRAMME

		INSTITUTIONAL LEARNING OUTCOMES		
ILOs OF THE PROGRAMME		(a)	(b)	(c)
	(a)	X		
	(b)	X		
	(c)		X	
	(d)			X

2.7 RELATIONSHIP BETWEEN AIMS AND INTENDED LEARNING OUTCOMES (ILOs) IN THE PROGRAMME

		PROGRAMME AIMS		
		(a)	(b)	(c)
ILOs OF THE PROGRAMME	(a)	X		
	(b)	X	X	X
	(c)			X
	(d)		X	

2.8 CURRICULUM MAP THAT WE TEACH (T), GIVE STUDENTS PRACTICE (P) AND MEASURE (M) THE INTENDED LEARNING OUTCOMES (ILOs) OF THE PROGRAMME

SUBJECT CODES	**SUBJECT TITLES**	**ILOs OF THE PROGRAMME**			
		a	**b**	**c**	**d**
ISE512	Warehousing & Material Handling Systems	TPM		PM	P
ISE518	Workflow Design & Management	TP		TPM	P
ISE520	Manufacturing Strategy	TPM		TPM	
ISE525	Global Operations & Logistics Management	TPM	PM	TPM	PM
ISE526	Enterprise Resources Planning	TPM	TP	TP	PM
ISE527	Logistics Information Systems	TPM	TP	TP	
ISE529	Dissertation		P	PM	PM
ISE544	Supply Chain Management Enabling Technologies	TPM	TP	TPM	
ISE548	Risk & Crisis Management	TPM	T	TP	
ISE550	Contemporary Logistics Issues in China	TPM	PM	TPM	PM
ISE553	Managing Six Sigma		TPM	TP	T
ISE5001	Technology Transfer and Commercialisation	TPM		TPM	
ISE5019	Optimization Modeling & Applications	TP	T	TPM	P
ISE5021	Technology Project Management	TPM	T	TP	T
ISE5606	Business Intelligence and Data Mining	TP	T		P
ISE5607	E-Learning Technologies & Practices		TP		TP
LGT5002	International Logistics Systems, Operations & Management	TPM	TPM	TPM	T
LGT5010	Port Policy & Management	TM	TP	TPM	
LGT5013	Transport Logistics in China	TP	TP	TP	
LGT5017	Maritime Logistics	TP	TP	TP	
LGT5164	Aviation Safety Management	TPM	TP	TPM	

FEEDBACK PROCESS

2.9 The Postgraduate Programme Committee and the Programme Leader are the elements of a feedback system in programme management. Their responsibilities include examining the information received from the stakeholders, modifying the plan as appropriate, using appropriate measurement data to evaluate the intended learning outcomes of the programme as the process is implemented, and suggesting changes in the subject content, the extracurricular content or any other revisions needed to improve the programme when its performance falls short of the benchmarks.

SECTION 3 - ADMISSION AND ENTRANCE REQUIREMENTS

ADMISSION

3.1 Applicants may apply for admission to the programme studying for the award of Master of Science. The maximum period of registration for full-time and part-time students is four years from the date of first registration. Application for extension will only be approved under exceptional circumstances.

MINIMUM ENTRANCE REQUIREMENTS

3.2 A Bachelor's degree with Honours in engineering, business, management, applied mathematics or science; or a professional qualification or the equivalent. Consideration will be given to candidates with appropriate work experience.

ENGLISH LANGUAGE REQUIREMENT

3.3 If applicants are not native speakers of English, and their Bachelor's degree or equivalent qualification is awarded by institutions where the medium of instruction is not English, applicants are expected to fulfill the following minimum English language requirement for admission purpose:

- A Test of English as a Foreign Language (TOEFL) score of 80 or above for the Internet-based test; or a TOEFL score of 550 or above for the paper-based test; OR

- An overall Band Score of at least 6 in the International English Language Testing System (IELTS)

Individual cases will be considered on their own merit by the department. Applicants may be required to attend interviews or tests to further demonstrate their language proficiency.

For applicants with qualifications obtained in Taiwan, a pass in the High-Intermediate level or above in GEPT may be considered as having fulfilled the English language requirements.

SELECTION PROCEDURE

3.4 The Programme Leader and Admission Officer are responsible for admission and the admission procedures. Interviews may be administered for the selection of students to the programme. Applicants will be selected on the basis of their academic qualifications, work experience and the programme's relevance to their employment. Preference may be given to industry sponsored candidates.

FREQUENCY OF ADMISSION AND REGISTRATION

3.5 Students will be admitted into the programme on an annual basis into Semester 1 of the academic year. Admission into Semester 2 is however possible on a top-up basis. Subject registration will be available in both semesters.

SECTION 4 – CURRICULUM STRUCTURE

4.1 For the award of an MSc degree, a student is required to take FIVE compulsory subjects and TWO elective subjects plus a dissertation (equivalent to 3 taught subjects), or a field trip subject (ISE550) with FOUR elective subjects. For the award of a PgD, a student has to take FOUR compulsory subjects plus TWO elective subjects.

4.2 To meet the challenge of worldwide manufacturing competition, it is important that our students should understand what information technologies can contribute in the effective utilization of resources and in the creation of systems that produce these products and services. In MSc in Industrial Logistics Systems (ILS) award, new and existing subjects are arranged as compulsory and elective as follows:

List A Compulsory subjects with emphasis on information management in logistics

ISE512	Warehousing and Material Handling Systems
ISE525	Global Operations and Logistics Management
ISE526	Enterprise Resources Planning
ISE527	Logistics Information Systems
ISE544	Supply Chain Management Enabling Technologies

List B Elective subjects cover a wide range of areas to suit the needs of students.

ISE518	Workflow Design and Management
ISE520	Manufacturing Strategy
ISE529	Dissertation
ISE548	Risk and Crisis Management
ISE550	Contemporary Logistics Issues in China
ISE553	Managing Six Sigma
ISE5001	Technology Transfer and Commercialisation
ISE5019	Optimization Modeling and Applications
ISE5021	Technology Project Management
ISE5606	Business Intelligence and Data Mining
ISE5607	E-learning Technologies and Practices
LGT5002	International Logistics Systems, Operations and Management
LGT5010	Port Policy and Management
LGT5013	Transport Logistics in China
LGT5017	Maritime Logistics
LGT5164	Aviation Safety Management

4.3 The above programme structure conforms to the regulations in the Academic Regulations and Procedures for Credit-based Programmes published in December 1999, i.e. a minimum of FIVE mandatory compulsory subjects. This ensures students who wish to specialize in a particular area will be able to select the best mix of electives to cater for individual educational needs, aspirations and career development.

4.4 The curriculum structure contains compulsory subjects, elective subjects and dissertation. It is most likely that the composition of the curriculum will be reviewed from time to time so that less favored subjects will be offered in alternate years or withdrawn altogether if student demand for such subjects is consistently lower than the acceptable norm.

COMPULSORY SUBJECTS

4.5 The subject *Warehousing and Material Handling Systems (ISE512)* provides students with the methods and tools necessary for the design and management of warehousing and material handling systems. In particular, this subject emphasizes on the application of industrial engineering, computer systems as well as health and safety aspects in warehousing and material handling of various types of products. On completion students will be able to both analyze existing systems and recommend improvement to them and to conduct an investigation in order to recommend what equipment and system should be installed in a new situation.

4.6 Manufacturing companies are required to produce products in small batch sizes and short lead times to remain competitive so as to meet customers' expectations of variety. Accordingly, knowledge of production economics in the context of international operations is necessary for executives and engineers involved in resources management and hence *Global Operations and Logistics Management (ISE525)* is created in the curriculum. This subject provides students with the concepts, methodologies and the case studies in process planning, subcontracting, materials planning, purchasing, storage, retrieval, making, assembling, quality assurance, packing and shipping.

4.7 Enterprise resources planning is a modern technology that has been developed to schedule enterprise resources in the fulfillment of customer order. The subject is important to knowledge workers and accordingly, this is the reason why *Enterprise Resources Planning (ISE526)* has been created as a compulsory subject in the curriculum. It provides students with an understanding of various concepts in using information systems as tools for planning purposes. It will also give students the opportunity to obtain hands-on experience in synchronous production.

4.8 Personnel working in production logistics need to be able to apply the typical information management tools in order to discharge their duties effectively. In addition, they need to be able to recognize their advantages and limitations in practical circumstances. It is with this in mind that the compulsory subject *Logistics Information Systems (ISE527)* has been introduced. This subject includes introduction and application of various information systems as applied on the internet. The emphasis will be on business models, information systems development, methodologies and tools. The concepts behind web-based workflow management and problems associated with implementation will be explained in the context of organizing data and information, co-designing database schemas and applying database management techniques.

4.9 Different techniques can be applied to solve traditional logistics and supply chain process problems. The subject *Supply Chain Management Enabling Technologies (ISE544)* provides students with knowledge in applying latest business technology for logistics and supply chain systems in the running of their business activities to enable efficient information capturing, processing and exchanges among various business entities in today's supply chain and logistics environment. It

integrates the business technology with existing logistics infrastructure to form a more effective system.

ELECTIVE SUBJECTS

4.10 Elective subjects consist of a pool of subjects on managing specific activities of an enterprise such as risk and crisis management, project management, manufacturing strategy, simulation logistics, optimization modeling, data mining, technology transfer, workflow management, maritime logistics and aviation safety management, etc. These subjects cover a wide range of areas to suit the needs of individual students.

DISSERTATION

4.11 The dissertation (ISE529) comprises a single piece of work. The work should be of a standard which manifests the student's ability to undertake an applied research or theoretical research within the professional context of logistics areas. The objective of this work is to enhance the competence of the students in conducting research and development relating to logistics in their companies. Creative skills and innovative thinking in the application of advanced knowledge and theory learned in this programme to solve real industrial problem should be demonstrated.

4.12 The dissertation carries a weight equivalent to 9 credits or three taught subjects. It represents around 420 hours of student effort. Students will continue with their jobs while they work on their dissertations. The subject of the dissertation will preferably be related to the students' employment. The normal period for completion of a dissertation is 3 semesters. Students who are not able to complete their dissertations within the normal period may apply on the advice of the supervisor to extend the dissertation registration beyond the normal period but within the maximum period of 4 semesters.

4.13 Students registered for the Master of Science award will be advised to register for their dissertation after completion of their fourth subjects. However, they will not be allowed to register for their dissertation if they have achieved a GPA of less than 2.5.

4.14 Students usually continue with their jobs while they work on their dissertations, the subject of the dissertation is preferably related to the student's employment. The dissertation should be an exposition of a student's own work and ideas. Where others have had an input (e.g. in a team situation) this should be clearly identified. Since the subject areas of dissertations are so diverse it is impossible to define a standard approach to contents, which should include an introduction and definition of objectives, a literature survey, a review of the problem followed by a description of the student's approach to solving the problem, the results or findings, an intellectual analysis of the results or findings, and finally a logical review of the conclusions drawn.

4.15 Students are encouraged to initiate dissertation topics relating to their employment. However, students may take up campus based dissertations in cases of difficulty. A seminar will be given to the students to assist them writing a dissertation proposal. The purpose of the Dissertation Seminar is to enable students to identify and define a problem for valid research, to develop their abilities to identify and evaluate appropriate

research methods, and to provide a framework from which students can begin their own research work. The content of the seminars will include research methods, research design, analysis of data, presentation of findings, and ethical and legal considerations. Staff members active in research will participate and interact with students in answering questions and leading discussion on major issues. Subsequent to the Dissertation Seminar, the student will prepare a dissertation proposal in a standard format using a synopsis form. Students are expected to submit their dissertation proposal to the Dissertation Coordinator for approval.

A dissertation proposal should consist of the following:

- objectives
- content which includes innovative features, challenge, academic value and applicability
- methodology
- references
- scheduled programme of work
- description of facilities required and justification
- starting date
- expected completion date

4.16 Under normal circumstances, with the agreement of the supervisors, students may prepare for assessment after satisfactory progress. There will be a progress review by the end of the first semester. FOUR unbound copies of the dissertation shall be submitted, together with a Dissertation Submission Form to the academic supervisor and one copy shall be kept by the student one month prior to the end of the semester. After submission of the unbound copies of the dissertation the academic supervisor shall make arrangements with the assistance of the department on a mutually convenient time and place for an oral examination at which the other assessors will be present. The assessment panel will consist of three categories of member, namely, the supervisors (academic, professional and co-supervisor if relevant), a second assessor who is a subject expert from the department, from another department in the University, or from industry, to be nominated by the academic supervisor and approved by the Dissertation Coordinator where approval authority has been delegated; and a moderator appointed by the Programme Leader or the Dissertation Coordinator to provide quality control.

4.17 The amount of effort required by students in the dissertation should clearly be reflected in the quantity and quality of the final submission. In assessing the standard of dissertations supervisors will be seeking to ensure that the student has met with the aims of this part of the programme. The student and academic supervisor should contact each other from time to time to discuss progress against his/her agreed programme. The responsibility for arranging meetings between the student and academic supervisor is shared by both parties. The academic supervisor will provide guidance to complement that available within the student's employing organization and advice the student about the style of presentation of the dissertation. Academic and professional supervisors will liaise as circumstances require. The academic supervisor will be available for consultation on a regular basis both at the University and at the student's workplace according to circumstances. The role of the professional supervisor is to be able to assess the student’s effort in the workplace and assist in the conduct of the oral examination and provide assurance that the candidate's work has been independently

done. Students should approach a prospective professional supervisor and explain their requirements and should obtain his/her agreement to act as professional supervisor. If the work for the dissertation forms part of a group endeavor within the student's organization, it is essential that the student's personal contribution can be identified and that the professional supervisor can speak for the part that the student has played. In cases where no suitable professional supervisor can be found, the Committee will appoint a second academic supervisor to take the place of the professional supervisor. If the dissertation topic is based in the student's workplace, visits to the student's place of work by the academic supervisor(s) will be necessary.

4.18 A field trip subject as a replacement for Dissertation

As an alternative to taking the dissertation, student may opt for THREE elective subjects in the list which must include *Contemporary Logistics Issues in China (ISE550).*

SECTION 5 - EXAMINATION AND ASSESSMENT

GENERAL ASSESSMENT REGULATIONS (GAR)

5.1 The University's General Assessment Regulations shall apply to the programme MSc in Industrial Logistics Systems. The specific assessment regulations are set out here, having been developed within the framework of the GAR.

ASSESSMENT METHODS

5.2 Students' performance in a subject can be assessed by continuous assessment and/or examination, at the discretion of the individual subject offering Department. Where both continuous assessment and examination are used, the weighting of each in the overall subject grade is clearly stated in Section 8 of this document. The subject offering Department can decide whether students are required to pass both the continuous assessment and examination components, or either component only, in order to obtain a subject pass, but this requirement (to pass both, or either, components) will be specified in Section 8 of this document. Learning outcome should be assessed by continuous assessment and/or examination appropriately, in line with the outcome-based approach.

5.3 Continuous assessment may include tests, assignments, projects, laboratory work, field exercises, presentations and other forms of classroom participation. Continuous Assessment assignments which involve group work should nevertheless include some individual components therein. The contribution made by each student in continuous assessment involving a group effort shall be determined and assessed separately, and this can result in different grades being awarded to students in the same group.

5.4 Assessment methods and parameters of subjects shall be determined by the subject offering Department.

GRADING

5.5 Assessment grades shall be awarded on a criterion-referenced basis. A student's overall performance in a subject shall be graded as follows:

Subject grade	***Grade Point***	***Short description***	***Elaboration on subject grading description***
A+	4.5	Exceptionally Outstanding	The student's work is exceptionally outstanding. It exceeds the intended subject learning outcomes in all regards.
A	4.0	Outstanding	The student's work is outstanding. It exceeds the intended subject learning outcomes in nearly all regards.
B+	3.5	Very Good	The student's work is very good. It exceeds the intended subject learning outcomes in most regards.
B	3.0	Good	The student's work is good. It exceeds the intended subject learning outcomes in some regards.

Subject grade	*Grade Point*	*Short description*	*Elaboration on subject grading description*
C+	2.5	Wholly Satisfactory	The student's work is wholly satisfactory. It fully meets the intended subject learning outcomes.
C	2.0	Satisfactory	The student's work is satisfactory. It largely meets the intended subject learning outcomes.
D+	1.5	Barely Satisfactory	The student's work is barely satisfactory. It marginally meets the intended subject learning outcomes.
D	1.0	Barely Adequate	The student's work is barely adequate. It meets the intended subject learning outcomes only in some regards.
F	0	Inadequate	The student's work is inadequate. It fails to meet many of the intended subject learning outcomes.

F' is a subject failure grade, whilst all others ('D' to 'A+') are subject passing grades. No credit will be earned if a subject is failed.

5.6 At the end of a semester, a Grade Point Average (GPA) will be computed as follows, and based on the grade point of all the subjects:

$$GPA = \left[\frac{\sum_n \text{Subject Grade Point} \times \text{Subject Credit Value}}{\sum_n \text{Subject Credit Value}} \right]$$

Where n = number of all subjects (inclusive of failed subjects) taken by the student up to and including the latest semester/term, but for subjects which have been retaken, only the grade point obtained in the final attempt will be included in the GPA calculation.

5.7 Exempted, ungraded and incomplete subjects, subjects for which credit transfer has been approved without any grade assigned ^, and subjects from which a student has been allowed to withdraw, i.e. those with the Grade "W" will be excluded from the GPA calculation. Subjects which have been given an "S" grade code i.e. absent from assessment, will be included in the GPA calculation and will be counted as "zero" grade point. The GPA is thus the unweighted cumulative average calculated for a student, for all relevant subjects taken from the start of the programme to a particular point of time. GPA is an indicator of overall performance, and is capped at 4.0

^ Subjects taken in PolyU or elsewhere and with grades assigned, and for which credit transfer has been approved, will be included in the GPA calculation.

DISSERTATION ASSESSMENT

5.8 Students are expected to submit a dissertation proposal to the Dissertation Coordinator no later than the last day of the semester in which he/she first registers for the dissertation. Staff contacts with industry, their research and consultancy work may lead

to project proposals too. Dissertation proposals will be assessed for suitability by an ad hoc panel convened by the Dissertation Coordinator.

5.9 Students will be required to complete their dissertations normally within 3 semesters. Those who are not able to complete their dissertations may apply on the advice of the supervisors to extend the dissertation registration beyond the normal period but within the maximum period of 4 semesters. The application must be recommended by the relevant Dissertation Coordinator and must be approved by the Programme Leader. Applications for extension beyond the normal period will only be approved under exceptional circumstances.

5.10 The assessment panel will consist of the following members, namely:

(i) the academic supervisor(s)
(ii) a second assessor who is a subject expert from the department, or from another department in the University, or from industry, to be nominated by the academic supervisor(s) and approved by the Dissertation Coordinator,
(iii) and a moderator appointed by the Programme Leader or the Dissertation Coordinator to provide quality control.

5.11 A copy of the dissertation should be sent to each of the assessors and one copy should be kept by the student.

5.12 After submission of the final report, the academic supervisor should make arrangements with the assistance of the department on a mutually convenient time and place for an oral examination at which the other assessors will be present. The date set for the oral examination should allow sufficient time for the examiners to read the submission and should normally be no later than one month after submission of the dissertation.

5.13 After conducting the oral examination, the assessment panel will jointly allocate a grade guided by the following weightings which may vary depending on the nature of the project.

Progress 20% + Dissertation 50% + Oral 30% = Total 100%

5.14 A moderator appointed by the Programme Leader or Dissertation Coordinator will subsequently moderate the dissertations to ensure that proper standards are maintained and that fairness and consistency are practiced in the grades awarded.

5.15 Students failing their dissertations will not be allowed to re-take their dissertation subjects.

DIFFERENT TYPES OF GPA

5.16 GPA will be calculated for each Semester including the Summer Term. This Semester GPA will be used to determine students' eligibility to progress to the next Semester alongside with the 'cumulative GPA'. However, the Semester GPA calculated for the Summer Term will not be used for this purpose, unless the Summer Term study is mandatory for all students of the programme concerned and constitutes part of the graduation requirements.

5.17 The GPA calculated after the second Semester of the students' study is therefore a 'cumulative' GPA of all the subjects taken so far by students, and without applying any level weighting.

5.18 Along with the 'cumulative' GPA, a weighted GPA will also be calculated, to give an indication to the Board of Examiners on the award classification which a student will likely get if he makes steady progress on his/her academic studies.

5.19 When a student has satisfied the requirements for award, an award GPA will be calculated to determine his/her award classification.

PROGRESSION/ACADEMIC PROBATION/DEREGISTRATION

5.20 The Board of Examiners shall, at the end of each semester (except for Summer Term unless there are students who are eligible to graduate after completion of Summer Term subjects or the Summer Term study is mandatory for the programme), determine whether each student is:

(i) eligible for progression towards an award; or
(ii) eligible for an award; or
(iii) required to be de-registered from the programme.

When a student has a GPA lower than 2.0, he/she will be put on academic probation in the following semester. Once when a student is able to pull his/her GPA up to 2.0 or above at the end of the semester, the status of "academic probation" will be lifted. The status of "academic probation" will be reflected in the examination result notification but not in transcript of studies.

5.21 A student will have 'progressing' status unless he falls within any one of the following categories which shall be regarded as grounds for de-registration from the programme:

(i) the student has exceeded the maximum period of registration for the programme; or

(ii) the student's GPA is lower than 2.0 for two consecutive semesters and his/her Semester GPA in the second semester is also lower than 2.0; or

(iii) the student's GPA is lower than 2.0 for three consecutive semesters.

When a student falls within the categories as stipulated above, the Board of Examiners shall de-register the student from the programme without exception.

A student may be deregistered from the programme enrolled before the time frame specified in (ii) or (iii) above if his/her academic performance is poor to the extent that the Board of Examiners considers that there is not much of chance for his/her to attain a GPA of 2.0 at the end of the programme.

If the student is not satisfied with the de-registration decision of the Board of Examiners, he/she can lodge an appeal. All such appeal cases will be referred directly to Academic Appeals Committee (AAC) for final decision. Views of Faculties/Schools/Departments will be sought and made available to AAC for reference.

UNIVERSITY GRADUATION REQUIREMENTS

5.22 A student is eligible for award if he/she satisfies all the conditions listed below:

(i) An accumulation of 30 credits for the MSc degree (5 compulsory, 2 electives plus a dissertation; OR 5 compulsory, 4 electives plus the field trip subject ISE550). For the award of a PgD, a student must accumulate 18 credits (6 subjects, 4 compulsory with 2 electives);

(ii) Students must satisfy the residential requirement for at least 1/3 of the credits to be completed for the award he/she is currently enrolled in PolyU;

(iii) All requirements as defined in the definite programme document and as specified by the University are satisfied; and

(iv) For both the PgD and MSc awards, the student's final GPA must be 2.0 or above.

5.23 The awards of PgD and MSc are classified as: Distinction, Credit and Pass.

5.24 A student is required to graduate as soon as he/she satisfies all the conditions for award. Subject to the maximum study load of 21 credits per semester, a student may take more credits than he/she needs to graduate on top of the prescribed credit requirements for his/her award in or before the semester within which he/she becomes eligible for award.

GUIDELINES FOR AWARD CLASSIFICATION

5.25 To help the Board of Examiners in arriving at award classification decisions, a weighted GPA will be computed for each student upon completion of the programme. The Weighted GPA will be computed as follows:

$$\text{Weighted GPA} = \left[\frac{\sum_n \text{Subject Grade Point} \times \text{Subject Credit Value} \times Wi}{\sum_n \text{Subject Credit Value} \times Wi} \right]$$

where Wi = weighting to be assigned according to the level of the subject

n = number of all subjects counted in GPA calculation as set out in paragraph 5.23, except those exclusions that any subjects passed after the graduation requirement has been met will not be taken into account of in the grade point calculation for award classification.

The weighting of each level is a measure of the relevance of the level to the classification of the award. Same as GPA, weighted GPA is capped at 4.0.

5.26 The contribution of each subject towards the weighted GPA depends on the product of the credits assigned and the level weighting. The weighted GPA will be used as one of the factors to be considered by the Board of Examiners in the determination of the award classifications. The weighting of subjects in Levels 2, 3 and 4 are 0.2, 0.3 and 0.5, respectively. Level 5 subjects are also weighted at 0.5.

5.27 Any subjects passed after the graduation requirement has been met or subjects taken on top of the prescribed credit requirements for award shall not be taken into account in the grade point calculation for award classification. However, if a student attempts more elective subjects (or optional subjects) than those required for graduation in or before the semester in which he becomes eligible for award, the elective subjects (or optional subjects) with a higher grade/contribution shall be included in the grade point calculation (i.e. the excessive subjects attempted with a lower grade/calculation, including failed subjects, will be excluded).

5.28 The following are guidelines for Board of Examiners' reference in determining award classifications:

Award	Guidelines
Distinction	The student's performance/attainment is **outstanding**, and identifies him/her as **exceptionally able** in the field covered by the programme in question.
Credit	The student has reached a standard of performance/attainment which is **more than satisfactory** but **less than outstanding**.
Pass	The student has reached a standard of performance/ attainment ranging from **just adequate to satisfactory.**

CLASSIFICATION OF AWARD

5.29 The following table may also be used as a reference for the Board of Examiners in determining award classifications:

Award Classification	GPA or Weighted GPA
Distinction	3.7^{+} to 4.0
Credit	3.2^{+} to 3.7^{-}
Pass	2.0^{+} to 3.2^{-}

"+" sign denotes 'equal to and more than'; "–" sign denotes 'less than'.

5.30 There is no requirement for Boards of Examiners to produce award lists which conform to the guidelines in above.

5.31 Students who have committed academic dishonesty will be subject to the penalty of the lowering of award classification by one level. The minimum of downgraded overall result will be kept at a Pass. In rare circumstances where both the Student Discipline Committee and Board of Examiners of a department consider that there are strong justifications showing the offence be less serious, the requirement for lowering the award classification can be waived.

VALIDITY OF CREDITS

5.32 The validity period of credits earned is eight years from the year of attainment, i.e. the year in which the subject is completed. Credits earned from previous studies should remain valid at the time when the student applies for credit transfer.

RETAKING OF SUBJECTS

5.33 Students may retake any subject for the purpose of improving their grades without having to seek approval, but they must retake a compulsory subject which they have failed, i.e. obtained an F grade. Retaking of subjects is with the condition that the maximum study load of 21 credits per semester is not exceeded. Students wishing to retake passed subjects will be accorded a lower priority than those who are required to retake (due to failure in a compulsory subject) and can only do so if places are available.

5.34 The number of retakes of a failed subject is not restricted. Only the grade obtained in the final attempt of retaking (even if the retake grade is lower than the original grade for originally passed subject) will be included in the calculation of the Grade Point Average (GPA). If students have passed a subject but failed after retake, credits accumulated for passing the subject in a previous attempt will remain valid for satisfying the credit requirement for award. (The grades obtained in previous attempts will only be reflected in transcript of studies.)

5.35 In cases where a student takes another subject to replace a failed elective subject, the fail grade will be taken into account in the calculation of the GPA, despite the passing of the replacement subject.

ABSENCE FROM AN ASSESSMENT COMPONENT

5.36 If a student is unable to complete all the assessment components of a subject, due to illness or other circumstances which are beyond his/her control and considered by the subject offering department as legitimate, the Department will determine whether the student will have to complete a late assessment and, if so, by what means. This late assessment shall take place at the earliest opportunity, and before the commencement of the following academic year (except that for Summer Term, which may take place within 3 weeks after the finalisation of Summer Term results). If the late assessment cannot be completed before the commencement of the following academic year, the Faculty Board Chairman shall decide on an appropriate time for completion of the late assessment.

5.37 The student concerned is required to submit his/her application for late assessment in writing to the Head of Department offering the subject, within five working days from the date of the examination, together with any supporting documents. Approval of applications for late assessment and the means for such late assessments shall be given by the Head of Department offering the subject or the Subject Lecturer concerned, in consultation with the Programme Leader.

5.38 For cases where students fail marginally in one of the components within a subject, the BoE can defer making a final decision until the students concerned have completed the necessary remedial work to the satisfaction of the subject examiner(s). The remedial work must not take the form of re-examination.

AEGROTAT AWARD

5.39 If a student is unable to complete the requirements of the programme in question the award, due to very serious illness, or other very special circumstances which are beyond his/her control, and are considered by the Board of Examiners as legitimate, the Faculty/School Board will determine whether the student will be granted aegrotat award. Aegrotat award will be granted under very exceptional circumstances.

5.40 A student who has been offered an aegrotat award shall have the right to choose either to accept such an award or request to be assessed on another occasion as stipulated by the Board of Examiners, the student's exercise of this option shall be irrevocable. The acceptance of an aegrotat award by a student shall disqualify him/her from any subsequent assessment for the same award. An aegrotat award shall normally not be classified, and the award parchment shall not state that it is an aegrotat award. However, the Board of Examiners may determine whether the award should be classified provided they have adequate information on the students' academic performance.

OTHER PARTICULAR CIRCUMSTANCES

5.41 A student's particular circumstances may influence the procedures for assessment but not the standard of performance expected in assessment.

RECORDING OF DISCIPLINARY ACTIONS IN STUDENTS' RECORDS

5.42 With effect from Semester One of 2015/16, disciplinary actions against students' misconducts will be recorded in students' records.

5.43 Students who are found guilty of academic dishonesty will be subject to the penalty of having the subject result concerned disqualified and be given a failure grade with a remark denoting 'Disqualification of result due to academic dishonesty'. The remark will be shown in the students' record as well as the assessment result notification and transcript of studies, until their leaving the University.

5.44 Students who have committed disciplinary offences (covering academic and non-academic related matters) will be put on 'disciplinary probation'. The status of 'disciplinary probation' will be shown in the students' record as well as the assessment result notification, transcript of studies and testimonial during the probation period, until their leaving the University. The disciplinary probation is normally one year unless otherwise decided by the Student Discipline Committee.

5.45 The University reserves the right to withhold the issuance of any certificate of study to a student who has unsettled matters with the University, or subject to disciplinary action.

SECTION 6 - PROGRAMME OPERATION AND CONTROL

FREQUENCY OF SUBJECTS TO BE OFFERED

6.1 Subjects are normally offered once a year. There are, however, several common subjects shared by other programme(s) in the PolyU which may be available in both semesters. Subject to the availability of resources, the Department will attempt to offer as many subjects as possible in both semesters. In all cases, students entering the programme will be able to complete all the requirements for the award in 1 year (full-time mode) or 2 years (part-time mode).

EVENING, WEEKEND AND SUMMER TEACHING

6.2 The subjects for this award will usually be offered in the evenings or weekends during Semester 1 and 2. Subject to departmental resources, teaching may be provided in summer term.

SUBJECT REGISTRATION AND WITHDRAWAL

6.3 Students may apply for withdrawal of their registration on a subject after the add/drop period if they have a genuine need to do so. The application should be made to the relevant programme offering department and will require the approval of both the subject lecturer and the Programme Leader concerned. Application submitted after the commencement of the examination period will not be considered. For approved applications of subject withdrawal, the tuition fee paid for the subject will be forfeited and the withdrawal status of the subject will be shown in the examination result notification and transcript of studies but will not be counted towards the calculation of GPA.

STUDY LOAD

6.4 Students are not allowed to take zero subject in any semester unless they have obtained prior approval from the Department; otherwise they will be classified as having unofficially withdrawn from their programme of study. Any semesters in which students are allowed zero subject will be counted towards the maximum period of registration. Students will be responsible for ensuring that they complete their programme of study within the maximum period of registration. The latter are shown in Table 6.1 below.

6.5 Students enrolled on mixed-mode programmes are required to take 9 credits or more in a semester in order to retain full-time status. Otherwise, they will be given a part-time status.

6.6 To help improve the academic performance of students on academic probation, these students will be required to take a reduced study load in the following semester (Summer Term excluded). The maximum number of credits to be taken

by the students varies according to the policies of individual Departments and will be subject to the approval of the authorities concerned.

SUBJECR EXEMPTION

6.7 Students may be exempted from taking any specified subjects, if they have successfully completed similar subjects previously in another programme or have demonstrated the level of proficiency/ability to the satisfaction of the subject offering Department. Subject exemption is normally decided by the subject offering Department If students are exempted from taking a specified subject, the credits associated with the exempted subject will not be counted towards meeting the award requirements (except for exemptions granted at admission stage). It will therefore be necessary for the students to consult the programme offering Department and take another subject in order to satisfy the credit requirement for the award.

CREDIT TRANSFER

6.8 Students may be given credits for recognised previous studies and the credits will be counted towards meeting the requirements for award. Transferred credits may be counted towards more than one award. The granting of credit transfer is a matter of academic judgment.

6.9 Credit transfer may be done with or without the grade being carried over; the former should normally be used when the credits were gained from PolyU. Credit transfer with the grade being carried over may be granted for subjects taken from outside the University, if deemed appropriate, and with due consideration to the academic equivalence of the subjects concerned and the comparability of the grading systems adopted by the University and the other approved institutions. Subject credit transfer is normally decided by the subject offering Department.

6.10 The validity period of credits previously earned is up to 8 years after the year of attainment.

6.11 Normally, not more than 50% of the credit requirement for award may be transferable from approved institutions outside the University. For transfer of credits from programmes offered by PolyU, normally not more than 67% of the credit requirement for award can be transferred. In cases where both types of credits are being transferred (i.e. from programmes offered by PolyU and from approved institutions outside the University), not more than 50% of the credit requirement for award may be transferred.

6.12 If a student is waived from a particular stage of study on the basis of advanced qualifications held at the time of admission, the student concerned will be required to complete fewer credits for the award. For these students, the deducted credits at admission stage will be counted towards the maximum limit for credit transfer when students apply for further credit transfer after their admission.

6.13 All credit transfers approved will take effect only in the semester for which they are approved. A student who applies for transfer of credits during the re-enrolment or the add/drop period of a particular semester will only be eligible for graduation at the end of that semester, even if the granting of credit transfer will immediately enable the student to satisfy the credit requirement for the award.

6.14 For credit transfer of retaken subjects, the grade attained in the last attempt should be taken in the case of credit transfer with grade being carried over. Students applying for credit transfer for a subject taken in other institutions are required to declare that the subject grade used for claiming credit transfer was attained in the last attempt of the subject in their previous studies. If a student fails in the last attempt of a retaken subject, no credit transfer should be granted, despite the fact that the student may have attained a pass grade for the subject in the earlier attempts.

6.15 Students should not be granted credit transfer for a subject which they have attempted and failed in their current study.

DEFERMENT OF STUDY

6.16 Students may apply for deferment of study if they have a genuine need to do so such as illness or posting to work outside Hong Kong. Approval from the Department is required. The deferment period will not count towards the maximum period of registration.

REGISTRATION PERIOD

6.17 Subjects within the programme will be offered often enough to enable students entering the programme with the minimum admission requirements and undertaking the normal study pattern to complete the award requirements within the normal durations; this is specified below in Table 6.1.

TABLE 6.1 - NORMAL STUDY DURATION AND MAXIMUM REGISTRATION

Award	Mode of Study	Normal Duration	Maximum Registration Period
MSc in Industrial Logistics Systems	Part-time	2 Years	4 Years
	Full-time	1 Year	4 Years

COMPULSORY GRADUATION

6.18 **As soon as students have satisfied the criteria for graduation in the programme, they will be required to graduate**. This requirement has been stipulated in order to ensure the most efficient use of the PolyU resources.

DEPARTMENTAL POSTGRADUATE PROGRAMME COMMITTEE

6.19 The Head of Department can decide on the composition of the Departmental Postgraduate Programme Committee. The Departmental Postgraduate Programme Committee will meet at least twice a year and additionally at the request of the Chairman or of one-third of its membership or of the Chairman of the Senate. It will exercise the overall academic and operational responsibility for the programme and its development within defined policies, procedures and regulations.

The Committee will be specifically responsible for the following:

(i) the effective conduct, organisation and development of the programme;

(ii) stimulation of the development of teaching methods and programme materials, through Heads of Departments, Theme Group Leaders, and the Educational Development Centre, as appropriate;

(iii) review of academic regulations, admission policy, assessment and examination methods;

(iv) formal submissions to appropriate professional bodies, normally via the Head of the host Department and in accord with the University's established procedures;

(v) the continuing critical review of the rationale, aims, intended learning outcomes (ILOs) and the alignment of teaching, learning and assessment with the ILOs, programme learning outcomes assessment and its results, and the improvement and development of the programme(s);

(vi) definition and maintenance of the programme's academic standard;

(vii) ensuring that the views of students and other key stakeholders on the programme are known and taken into account;

(viii) evaluation of the operation, health and progress of the programme as defined in the University's programme review procedures.

PROGRAMME LEADER

6.20 A Programme Leader will normally be a member of the programme offering Department and be appointed by the Head of Department. The appointment will be subject to the confirmation by the Chairman of the appropriate Faculty Board. In the unavoidable absence of a Programme Leader, an acting Programme Leader will be appointed by the Head of the programme offering Department. A

Programme Leader is accountable in day-to-day operational terms to the Head of Department; and will normally hold office for a full cycle of the programme, but can then be considered for re-nomination. The Programme Leader will provide the academic and organizational leadership for the programme.

PROGRAMME EXECUTIVE GROUP

6.21 For programmes which are substantial, e.g. in scale, in the range of subjects or complexity, a small Programme Executive Group, would normally manage the day-to-day operation of the programme within the agreed scheme. The Group would operate informally, be organized by the Programme Leader and typically include staff with key programme responsibilities. For relatively simple programmes, the Programme Leaders would manage the day-to-day operation of the programmes.

THEME GROUP LEADERS

6.22 Theme Group Leaders are senior members of academic staff appointed by the Head of Department. They are responsible for the activities and development of subjects within a theme group which are part of the curricula of the programmes offered by the Department.

STUDENT/STAFF CONSULTATIVE GROUP

6.23 The importance of assessing students' opinion on the organisation and running of the programme on a continual basis is recognised and formal arrangements for this purpose are in place. The Group should have equal numbers of students and staff that student membership should include all years of study under the normal progression pattern and other major student groupings, and that staff membership should cover all the main subject areas and activities of the programme. A member of staff may chair the Group. The Group is to discuss any matters directly related to the programme, and to report or make recommendations, as deemed necessary, to the Departmental Postgraduate Programme Committee. Meetings are usually held once per semester.

6.24 It is important that students do not perceive meetings of the Group as the only or main channel for dealing with student problems and complaints accumulated since the last meeting. Such matters would be dealt with when they occurred, through the Programme Leader or other appropriate staff. This would allow meetings of the Group to be used for constructive discussion of the programme in general, of the demands of the programme on students, and of possible improvements.

SECTION 7 - PROGRAMME EVALUATION AND DEVELOPMENT

7.1 The programme evaluation and development procedures are intended to assess the:

(i) extent to which the aims and objectives are being met and what measures need to be taken to remedy any deficiencies identified, and

(ii) continuing relevance of the aims and subject objectives and the ways they need to be modified to take account of technological change and the development of Hong Kong's industries.

7.2 The programme evaluation procedures are conducted at two levels: firstly at the Programme Executive Group/ Departmental Postgraduate Programme Committee level continuously through the year and secondly to the Departmental Postgraduate Programme Committee/Departmental Academic Advisor level at the end of each year. The first level is described in Section 6 of this document and the other below.

7.3 The Departmental Postgraduate Programme Committee holds its Annual Programme Review Meeting each year after the Board of Examiner has met as described in Section 5 of the DPD. The issues described in Section 6 are considered, particularly as revealed by the examination performance, and recommendations for action are made to remedy any deficiencies identified. Following the Annual Programme Review Meeting the Programme Leader submits the Annual Programme Report (which is encapsulated as part of the Department’s Business Plan) to the Engineering Faculty Board each year which, for the previous academic year,

(i) summarises the operation of the programme,

(ii) lists any modifications that are deemed necessary, and

(iii) makes proposals for substantial changes to the structure or content of the programme, or for changes with significant resource implications.

7.4 The Departmental Postgraduate Programme Committee adopts a policy of continuous improvement and is continuously evaluating the effectiveness and relevance of the Programme. This policy of continuous improvement includes soliciting the views of the Department's Advisory Committee, local industrialists, graduates and the Departmental Academic Advisor.

7.5 The Programme is subject to an evaluation, normally every six years, as part of the PolyU's Departmental Assessment exercise. This is external to the Department and makes a critical appraisal of the standing, progress and future of all programmes that a department operates. The policy of continuous improvement as mentioned in 7.4 attempts to render a major in-depth programme appraisal unnecessary prior to a Departmental Assessment.

SECTION 8 - SUBJECT SYLLABUSES

Syllabuses for the subjects are shown in Table 8 below, the compulsory subjects are listed first followed by the elective subjects.

The subject coordinators for the ISE subjects will be updated regularly. Please access the departmental website http://www.ise.polyu.edu.hk/programmes/info/1 for the updated information.

TABLE 8 - SYLLABUS INDEX

Subject Code	ISE512
Subject Title	Warehousing and Material Handling Systems
Credit Value	3
Level	5
Pre-requisite/Co-requisite/Exclusion	Nil
Objectives	This subject provides students with 1. a basic understanding of material handling facilities and the fundamental principles of material handling; 2. quantitative techniques for designing warehouse and material handling systems and an understanding of their limitations; 3. an understanding of safety issues and regulations in warehouse and material handling.
Intended Learning Outcomes	Upon completion of the subject, students will be able to a. select appropriate equipment for material handling and understand the basic roles of the different equipment; b. apply appropriate techniques for improving existing material handling systems; c. recognize the importance of safety issues in the areas of warehouse and material handling.
Subject Synopsis/ Indicative Syllabus	1. <u>Introduction to Basic Material Handling Equipment and Principles</u> Performance of physical work: conveyers, power trucks, cranes and hoists, robots, automated guided vehicles (AGVs), automated storage/retrieval systems. Assistance in material flow management: barcode systems, radio frequency identification (RFID), shelves, containers. Twenty principles of material handling from the College-Industry Council on Material Handling Education (CICMHE). 2. <u>Quantitative Techniques in Material Handling</u> Equipment selection: present value calculation, estimation of fixed and variable costs, calculation of the upper and lower bounds for equipment selection. Order picking and routing policies at warehouses. Warehouse layout design, methods of assigning dedicated storage. 3. <u>Material Transportation Optimization</u> AGV routing techniques. Behaviors of dynamic shortest paths with known events. Transportation and transshipment models. Vehicle-routing problems: traveling distance, customer demand, limited/unlimited capacity.

4. Regulations and Safety Issues

Health and safety aspects of warehouse and material handling systems. Types of legal liability and contributory negligence. Duty of care, breach of duty, causation and remoteness, damages, statutory duty, and employer liability.

Teaching/Learning Methodology

A mixture of lectures, tutorials, and laboratory exercises are used in this subject. External speakers may also be invited to convey practical knowledge to students. Group work such as mini-projects, laboratory work, or case studies in the related areas is employed to enhance students' problem-solving ability and team spirit. Tests and individual work assignments are designed to assess individual student performance.

Teaching/Learning Methodologies	Intended Subject Learning Outcomes to be assessed		
	a	b	c
Lecture	✓	✓	✓
Assignment/Laboratory	✓	✓	✓

Assessment Methods in Alignment with Intended Learning Outcomes

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed		
		a	b	c
1. Tests	50%	✓	✓	✓
2. Assignments	20%	✓	✓	✓
3. Laboratory exercises	30%	✓	✓	
Total	100%			

Laboratory exercises are designed to assess learning outcomes "a" and "b", and tests and assignments cover all of the intended outcomes of this subject.

Student Study Effort Expected

Class contact:	
▪ Lectures/Seminars/Tutorials 3 hours/week for 9 weeks	27 Hrs.
▪ Laboratory work 3 hours/week for 2 weeks plus 6 hours/week for 1 week	12 Hrs.
Other student study effort:	
▪ Assignments	40 Hrs.
▪ Self-study/Preparation work	40 Hrs.
Total student study effort	119 Hrs.

Reading List and References	1. Askin RG and Standridge CS 1993, *Modeling and Analysis of Manufacturing System*, New York, Wiley 2. McCormik EJ and Sanders M 1993, *Human Factors in Engineering and Design*, New York, McGraw-Hill 3. Bozer YA, Chapter 56: *Material Handling Systems, Handbook of Industrial Engineering: Technology and Operations Management*, 3nd edition, New York: John Wiley & Sons 4. Smith JD, Chapter 57: *Storage and Warehousing, Handbook of Industrial Engineering: Technology and Operations Management*, 3nd edition, New York: John Wiley & Sons 5. Francis RL and White JA 1998, *Facility Layout and Location: An analytical Approach, Englewood Cliffs*, NJ, Prentice-Hall 6. Muther R and Wheeler JD 1994, *Simplified Systematic Layout Planning*, Kansas City, MO, Management and Industrial Publication 7. Stanks J 1994, *Management Systems for Safety*, Financial Times, Pitman Publishing 8. Ridley J 2008, *Safety at work*, Routledge. 9. Konz A 1999, *Work Design: Industrial Ergonomics*, Holcomb Hathaway Pubs. 10. Alberto Garcia-diaz, J. Macgregor Smith 2007, *Facilities Planning and Design*, Prentice Hall 11. Edward Frazelle 2004, *World-class Warehousing and Material Handling*, McGraw Hill 12. Matthew P. Stephens, Fred E. Meyers 2013, *Manufacturing Facilities Design and Material Handling*, Prentice Hall

Subject Code	ISE525
Subject Title	Global Operations and Logistics Management
Credit Value	3
Level	5
Pre-requisite/Co-requisite/Exclusion	Nil
Objectives	This subject provides students with 1. the concept of global logistics operations and a comprehensive framework to tackle typical logistics problems; 2. techniques to achieve the target of supplying the right goods at the right time at the minimum cost; 3. an in-depth knowledge of operations and logistics management and relevant techniques to optimise trade-offs.
Intended Learning Outcomes	Upon completion of the subject, students will be able to a. understand the concept of global operations and design a logistics system within a global environment; b. apply relevant techniques to solve global logistics problems; c. optimise operations parameters to achieve trade-offs.
Subject Synopsis/ Indicative Syllabus	1. <u>Introduction to Global Operations and Logistics Management</u> Logistics strategies and planning, logistics organisation, management, and control. Designing the supply base and selecting suppliers and integrated logistics support. Cost modelling in the supply chain. Supply chain relationships. Analysing supply chain performance. Supplier/vendor rating, development, and continuous improvement. Selection and use of supply chain software. 2. <u>Introduction to the Elements of Logistics</u> The system life cycle and the need for logistics management. Developing a logistics strategy, and understanding the consequences of that strategy. The impact of information technology on logistics management. 3. <u>Measures of Logistics</u> Understanding factors including reliability, maintainability, supply, support, transportation, packaging, and handling. Economic considerations. 4. <u>Phases of Logistics</u> Design and development, production/construction, utilisation and support, system retirement and material recycling/disposal.

5. Global Operations Management

The just-in-time philosophy, operations planning and control, the management of capacity, techniques for achieving delivery performance, the use of computers, distribution networks and the measurement and control of logistics performance, mathematical modelling of distribution in the supply chain, stochastic optimisation for logistics planning, network distribution.

Teaching/Learning Methodology

A mixture of lectures, tutorial exercises, and case studies is used to deliver the various topics in this subject. Some material is covered using a case-based format where this enhances the learning objectives. Other material is covered through directed study to enhance the students' "learning to learn" ability. Topics are introduced in the lectures. The tutorials are conducted in groups to reinforce the material covered in the lectures. Students also have the opportunity to use the computer packages to perform analysis.

Teaching/Learning Methodologies	Intended Subject Learning Outcomes to be assessed		
	a	b	c
Lecture	✓	✓	✓
Laboratory work	✓	✓	✓
Case studies	✓	✓	

Assessment Methods in Alignment with Intended Learning Outcomes

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed		
		a	b	c
1. Laboratory reports	25%	✓	✓	✓
2. Individual assignments	20%	✓	✓	✓
3. Case study/Group project	30%	✓	✓	✓
4. Test	25%	✓	✓	✓
Total	100%			

The laboratory reports and individual assignments are designed to assess students' understanding of the taught techniques to solve global logistics problems. The case study and group project are designed to appraise students' ability to apply relevant techniques to achieve process optimisation. The test is designed to measure the students' depth of knowledge in the area of global operations and logistics management.

Student Study Effort Expected

Class contact:	
▪ Lectures	21 Hrs.
▪ Case study	12 Hrs.
▪ Laboratory work	6 Hrs.

	Other student study effort:	
	▪ Case study preparation and report writing	45 Hrs.
	▪ Test preparation	28 Hrs.
	Total student study effort	112 Hrs.
Reading List and References	1. Branch, AE. 2009, *Global Supply Chain Management and International Logistics*, Routledge, New York/London 2. Gattorna, J & Friends. 2009, *Dynamic Supply Chain Alignment: A New Business Model for Peak Performance in Enterprise Supply Chains Across All Geographies*, Gower Pub., Burlington, VT/Farnham, England 3. Blanchard, BS. 2004, *Logistics Engineering and Management*, 6th edn, Prentice Hall, Inc., Upper Saddle River, N.J. 4. Christopher, M. 2000, *Logistics and Supply Chain Management: Strategies for Reducing Cost and Improving Service*, 2nd edn, Prentice Hall	

Subject Code	ISE526
Subject Title	Enterprise Resources Planning
Credit Value	3
Level	5
Pre-requisite/Co-requisite/Exclusion	Nil
Objectives	This subject provides students with 1. the basic concepts of ERP systems for manufacturing or service companies, and the differences among MRP, MRP II, and ERP systems; 2. thinking in ERP systems: the principles of ERP systems, their major components, and the relationships among these components; 3. in-depth knowledge of major ERP components, including material requirements planning, master production scheduling, and capacity requirements planning; 4. knowledge of typical ERP systems, and the advantages and limitations of implementing such systems.
Intended Learning Outcomes	Upon completion of the subject, students will be able to a. examine systematically the planning mechanisms in an enterprise, and identify all components in an ERP system and the relationships among the components; b. understand production planning in an ERP system, and systematically develop plans for an enterprise; c. use methods to determine the correct purchasing quantity and right time to buy an item, and apply these methods to material management; d. understand the difficulties of a manufacturing execution system, select a suitable performance measure for different objectives, and apply priority rules to shop floor control.
Subject Synopsis/ Indicative Syllabus	1. <u>Introduction</u> Concept of ERP, brief history of ERP systems, major components of ERP systems and their functions. Basic differences between manufacturing and services. 2. <u>Production Planning</u> Master production scheduling (MPS), rough-cut capacity planning, capacity requirements planning. 3. <u>Material Requirements Planning (MRP)</u> Concept, product structure, and bill of materials (BOM), MRP logic, lot-

sizing and capacity considerations.

4. Manufacturing Execution Systems (MES)

   Shop floor control, job shop scheduling and priority rules, flow shop scheduling.

5. Operation of an ERP system

   The relationships among different ERP modules, available-to-promise (ATP), time bucket.

6. Inventory Management

   Benefit and cost considerations in inventory management, basic models and their assumptions.

Teaching/Learning Methodology

A mixture of lectures, exercises, laboratories, and case studies is used to deliver the various topics in this subject. Some material is covered using a problem-based format where this advances the learning objectives. Other material is covered through directed study to enhance students' "learning to learn" ability. Some case studies, largely based on consultancy experience, are used to integrate these topics and demonstrate to students how the various techniques are interrelated and can be applied in real-life situations.

Teaching/Learning Methodologies	Intended Subject Learning Outcomes to be assessed			
	a	b	c	d
Lecture	✓	✓	✓	✓
Seminars	✓	✓	✓	✓
Project/case studies	✓	✓	✓	✓

Assessment Methods in Alignment with Intended Learning Outcomes

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed			
		a	b	c	d
1. Exercises	20%	✓	✓		
2. Project report	15%	✓	✓	✓	✓
3. Oral presentation	10%	✓	✓	✓	✓
4. Lab work and report	25%		✓	✓	
5. Test	30%	✓	✓	✓	✓
Total	100%				

Continuous assessment comprises tasks with individual and group components, usually several exercises, a mini-project with an oral presentation and written report, laboratory work, and a test. All assessment components require students to apply and demonstrate what they have learnt in the course to address issues related to enterprise resource planning.

Student Study Effort Expected	Class contact:	
	▪ Lectures	27 Hrs.
	▪ Laboratories, Presentation, Test	12 Hrs.
	Other student study effort:	
	▪ Preparation and review, Self-study	63 Hrs.
	▪ Report writing	18 Hrs.
	Total student study effort	120 Hrs.
Reading List and References	1. Monk, E. F., Wagner, B. J. 2009, *Concepts in Enterprise Resource Planning*, 3rd edn, Course Technology Cengage Learning 2. Sumner, M. 2005, *Enterprise Resource Planning*, Pearson Education, Inc. 3. Vollmann, T. E., Berry, W. L. and Whybark, D. C. 1992, *Manufacturing Planning and Control Systems*, 3rd edn, Irwin 4. Plossl, G. W. 1985, *Production and Inventory Control: Principles and Techniques*, 2nd edn, Prentice Hall 5. Wallace, T. F., Kremzar, M. H. 2001, *ERP: Making It Happen*, John Wiley 6. Ferran, C., and Salim, R. 2008, *Enterprise Resource Planning for Global Economics: Managerial Issues and Challenges*, Information Science References 7. Shtub, A. 1999, *Enterprise Resource Planning (ERP): the Dynamics of Operations Management*, Kluwer Academic Publishers	

Subject Code	ISE527
Subject Title	Logistics Information Systems
Credit Value	3
Level	5
Pre-requisite/Co-requisite/Exclusion	Nil
Objectives	This subject provides students with the ability to 1. understand the theory, principles, and applications of logistics information systems (LISs); 2. describe the concepts of operations research for solving logistics optimization problems; 3. identify the relationship between data warehousing and online analytical processing (OLAP) in logistics operations; 4. apply artificial intelligence techniques for distribution planning and logistics operation improvement.
Intended Learning Outcomes	Upon completion of the subject, students will be able to a. demonstrate their understanding of LISs and how such systems can be used in existing work situations to identify how the dispersed operations of a supply chain network can be configured; b. examine the concepts of data preprocessing and OLAP in logistics operations; c. apply the concepts of operations research to physical distribution planning and logistics operation improvement; d. select appropriate LISs to achieve logistics intelligence.
Subject Synopsis/ Indicative Syllabus	The syllabus includes the following topics 1. <u>Introduction to Logistics Information Systems</u> LIS concepts and architecture for knowledge discovery in databases. Issues related to the use of database management systems in data mining and operations carried out during data preprocessing. Relationships among data warehousing, OLAP, and data processing. 2. <u>Applications of Logistics Information Systems</u> Linear programming for optimisation and transportation carrier operations. Genetic algorithms and simulated annealing for distribution planning. Artificial intelligence techniques for logistics operations. 3. <u>Strategies for Implementing Data Mining to Enhance Logistics Intelligence</u> Articulating data mining problems with logistics problems or objectives. Handling the critical steps required for success in logistics knowledge

discovery tasks. Evaluating logistics operations and enhancing the efficiency of logistics operations using suitable tools.

4. Case Studies

Application of logistics operation control systems; vehicle scheduling and routing.

Teaching/Learning Methodology

A mixture of lectures, tutorial exercises, and laboratory exercises is used to deliver the various topics in this subject. Some material is covered using a problem-based format where this advances the learning objectives. Other material is covered through case studies to enhance students' "learning to learn" ability. Some case examples, largely based on consultancy experience, are used to integrate these topics and demonstrate to students how the various techniques are interrelated and applied in logistics operations.

Teaching/Learning Methodologies	Intended Subject Learning Outcomes to be assessed			
	a	b	c	d
Lecture	✓			✓
Tutorial		✓	✓	
Seminars			✓	✓
Project/case studies	✓	✓	✓	✓

Assessment Methods in Alignment with Intended Learning Outcomes

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed			
		a	b	c	d
1. Assignments	40%	✓	✓		✓
2. Lab exercises	10%	✓			
3. Test	30%	✓			✓
4. Projects	20%			✓	✓
Total	100%				

The assignments are designed to assess students' ability to apply their knowledge of LISs and OLAP.

The laboratory exercises are designed to assess students' understanding of LISs.

The projects involve case studies through which students' understanding of the working principles, design concepts, and selection of LISs can be assessed.

The test is designed to assess students' understanding of the topics and whether they can present the concepts clearly.

Student Study Effort Expected

Class contact:		
▪ Lectures	3 hours/week for 6 weeks	18 Hrs.
▪ Tutorials	3 hours/week for 3 weeks	9 Hrs.

	▪ Laboratories 3 hours/week for 4 weeks	12 Hrs.
	Other student study effort:	
	▪ Assignment preparation	40 Hrs.
	▪ Presentation preparation and report writing	30 Hrs.
	▪ Test preparation	20 Hrs.
	Total student study effort	129 Hrs.
Reading List and References	1. Harrison, A. 2008, *Logistics Management and Strategy: competing Through the Supply Chain*, Harlow: Financial Times/Prentice Hall 2. *Logistics Management and Environmental Aspects: Special Innovative Conferences on Intelligent Transportation Systems and Telemetrics, Marketing, Vehicle Finance and Leasing. Croydon*, England: ISATA Düsseldorf Trade Fair, 1998 3. Dror, M. 2000, *Arc Routing: Theory, Solutions, and Applications*, Boston, MA: Kluwer Academic 4. Roiger, R. 2003, *Data Mining: A Tutorial-based Primer Boston*, Addison Wesley 5. *International Journal of Logistics: Research and Applications*, vol. 2 no. 3, Nov 1999.	

Subject Code	ISE544
Subject Title	Supply Chain Management Enabling Technologies
Credit Value	3
Level	5
Pre-requisite/Co-requisite/Exclusion	Nil
Objectives	This subject provides students with 1. a basic understanding of the concept of supply chain systems and how to apply relevant techniques to solve traditional logistics and supply chain process problems; 2. knowledge in applying the latest business technology for logistics and supply chain systems in the running of business activities to enable efficient information capturing, processing, and exchange among various business entities in today's supply chain and logistics environment; 3. working knowledge of the latest information and communication technology and an interactive environment in which to learn and practice their skills in supply chain applications.
Intended Learning Outcomes	Upon completion of the subject, students will be able to a. apply appropriate business technology for logistics and supply chain systems and data capturing techniques to improve data exchange and information flow; b. analyse existing logistics operations and design process improvement procedures in various supply chain areas; c. identify the advantages and limitations of business technology in various areas; d. integrate business technology into existing logistics infrastructures to form more effective systems.
Subject Synopsis/ Indicative Syllabus	1. <u>Introduction and Innovative Supply Chain Technology</u> Identification techniques (RFID/barcode technology); containerisation/material handling; mobile technology; collaborative commerce; data mining. 2. <u>Supply Chain Information Systems</u> Material requirements planning; enterprise resource planning; production data management; point-of-sale; supplier relationship management; customer relationship management; business intelligence. 3. <u>Standards, Best Practices, and Benchmarking</u> Supply chain operations reference (SCOR) model; supply chain process

mapping and benchmarking; best practices in supply chain management; standardisation of supply chain management; latest EPC and RFID developments and applications.

4. Case Studies and Implementation Strategies

Supplier and workflow management; vendor managed inventory (VMI); efficient consumer response (ECR); asset management; collaborative planning, forecasting, and replenishment (CPFR); third party logistics/fourth party logistics (3PL/4PL).

Teaching/Learning Methodology

A mixture of lectures, tutorials, laboratories, and small group discussions is used to deliver the various topics in this subject. Students are also required to read specified monographs and journal publications. Coursework is assessed based on literature reviews, individual and group assignments and reports, and presentations. Mini-projects are done by groups of students basing on real supply chain management cases. Both individual reports and group presentations contribute to the overall grade.

Teaching/Learning Methodologies	Intended Subject Learning Outcomes to be assessed			
	a	b	c	d
Lecture	✓	✓	✓	✓
Laboratory	✓		✓	
Group Discussion		✓	✓	✓
Project	✓	✓	✓	✓

Assessment Methods in Alignment with Intended Learning Outcomes

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed			
		a	b	c	d
1. Laboratory exercises	10%	✓		✓	
2. Assignments	40%	✓	✓	✓	✓
3. Mini-project report	20%	✓	✓	✓	✓
4. Test	30%	✓	✓	✓	✓
Total	100%				

Laboratory exercises allow students to practice the supply chain management enabling technologies learnt in the lectures. The individual and group assignments and reports give students the opportunity to share their ideas and apply their supply chain management knowledge in problem solving. The test is used to measure the students' individual performance in this subject.

Student Study Effort Expected

Class contact:	
▪ Lectures/Seminars 3 hours/week for 9 weeks	27 Hrs.

	▪ Laboratories/Tutorials 3 hours/week for 4 weeks	12 Hrs.
	Other student study effort:	
	▪ Self-study/Group discussions	38 Hrs.
	▪ Preparation for the mini-project presentation; writing up assignments	25 Hrs.
	▪ Preparation for the final examination	15 Hrs.
	Total student study effort	117 Hrs.
Reading List and References	1. Fiddis, C. 1998, *Managing Knowledge in the Supply Chain: The Key to Competitive Advantage*, Financial Times Retail & Consumer, London 2. Doz, Y.L. and Hamel, G. 1998, *Alliance Advantage: the Art of Creating Value through Partnering*, Harvard Business School Press, Boston, Mass 3. Miguel Fernandez-Ranada, F. Xavier Gurrola-Gal, Enrique Lopez-Tello 2000, *3C: A Proven Alternative to MRPII for Optimizing Supply Chain Performance*, St. Lucie Press, Boca Raton, FL 4. Ptak, C. A. 2004, *ERP: Tools, Techniques, and Applications for Integrating the Supply Chain*, St. Lucie Press, Boca Raton, FL 5. Buchel, A., Schonsleben, P. 1998, *Organizing the Extended Enterprise: IFIP TC5 / WG5.7 International Working Conference on Organizing the Extended Enterprise*, Chapman & Hall, Dordrecht; Norwell, Mass 6. Rankl, W. and Effing, W. 2003, *Smart Card handbook*, Wiley, Chichester; Hoboken, N.J. 7. Sadeh, N. 2002, *M-Commerce: Technologies, Services and Business Models*, Wiley, New York 8. Hedgepeth, W. O. 2007, *RFID Metrics: Decision Making Tools for Today's Supply Chains*, CRC Press/Talyor & Francis, Boca Raton, FL	

Subject Code	ISE518
Subject Title	Workflow Design and Management
Credit Value	3
Level	5
Pre-requisite/Co-requisite/Exclusion	No prerequisite but some background knowledge on workflow and management is preferred.
Objectives	This subject provides students with 1. the knowledge to analyze and redesign existing systems, and to design new work systems in various industrial and commercial environments in order to improve productivity; 2. the knowledge to apply relevant techniques and problem-solving methodologies so as to enable them to manage projects concerned with productivity improvement successfully; 3. the knowledge and techniques to analyze a new or existing layout in order to achieve improvement; 4. the ability to recognize the need for, and problems associated with, change in organizations.
Intended Learning Outcomes	Upon completion of the subject, students will be able to a. examine and measure productivity in a typical manufacturing or service organization in order to improve it; b. identify the differences between cause and effect in problem solving and apply suitable problem-solving techniques using both analytical and creative (or lateral) thinking; c. examine an existing work situation and conduct a work improvement program in a manufacturing or service organization in order to identify low productivity; d. recognize the objectives of facility location and layout planning in both manufacturing and service organizations to evaluate different locations, the effectiveness of different layouts, and use suitable techniques for improvement; e. understand the need for change in organizations and be able to apply appropriate strategies to affect change in an appropriate manner.
Subject Synopsis/ Indicative Syllabus	1. <u>Productivity</u> The importance of productivity and its measurement; Productivity measures in organizations; Total and partial productivity measures, their advantages and limitations; Causes of low productivity in organizations; Types of productivity improvement programs and how to select them.

	2. Problem Solving General problem-solving skills; Recognizing and defining problems; Use and applications of analytical and creative thinking; Barriers to creativity; Methods of stimulating creative thinking, such as attribute listing, analogy, brainstorming, etc. 3. Work Improvement Analysis and improvement of work methods, systems, and procedures; Selecting areas appropriate for work improvement; Choosing areas for improvement, recording the facts, examining, and developing improvements; Issues of implementation, and continuous improvement; Application to the analysis and improvement of work systems; An appreciation of Business Process Re-engineering (BPR) and continuous improvement, as approaches to improving work systems in organizations. 4. Location and Facility Planning Factors affecting the choice of location and the evaluation of alternatives; Types of layouts, including an appreciation of the systematic layout planning approach; Use of computers in layout planning; Types of flow lines, and line balancing issues. 5. Management of Change Introduction to managing changes in organizations; Problems associated with change and the effects that change has on the management and personnel concerned; Organizing for change and overcoming resistance to change.
Teaching/Learning Methodology	Emphasis is placed on a student-centered learning approach through a variety of case studies taken from realistic industrial and commercial situations. These case studies are often used to deliver the subject material in a scenario of problem-based learning that will integrate topics contained in the syllabus so as to make the subject material more interesting and meaningful to students. Typical Case Studies • Measuring productivity in an engineering company • Selecting areas for methods improvement in a small batch manufacturing company • Designing a flow-line to assemble a typical consumer product • Developing a home delivery service for a supermarket chain • Locating a centralized processing plant for a fast-food operation • Creating a layout of a manufacturing department that integrates both production equipment and office accommodation • Managing change in a commercial enterprise

Teaching/Learning Methodologies	Intended Subject Learning Outcomes to be assessed				
	a	b	c	d	e
Lecture	✓	✓	✓	✓	✓
Tutorial		✓		✓	✓
Project/case studies	✓	✓	✓	✓	✓

Assessment Methods in Alignment with Intended Learning Outcomes

Specific assessment methods/tasks	% Weighting	Intended subject learning outcomes to be assessed				
		a	b	c	d	e
Continuous assessment	45%	✓	✓	✓	✓	✓
Examination (open book)	55%	✓		✓	✓	✓
Total	100 %					

Continuous assessment is comprised of case studies with individual and group components. Note: Assessment of Intended Learning Outcomes (ILOs) may vary from year to year in terms of whether they are by continuous assessment or by examination. However, all ILOs are covered each year. Moreover, all assessment components require students to apply what they have learned to realistic work applications that often integrate the various topics covered. The examination (open-book format) is also applications oriented.

Student Study Effort Expected

Class contact:		
▪ Lecture	3 hours/week for 7 weeks	21 Hrs.
▪ Tutorial/case study	3 hours/week for 4 weeks	12 Hrs.
▪ Laboratory	3 hours/week for 2 weeks	6 Hrs.
Other student study effort:		
▪ Studying and self learning		40 Hrs.
▪ Case studies and report writing		26 Hrs.
Total student study effort		105 Hrs.

Reading List and References

1. Adedeji B. Badiru and Olufemi A. Omitaomu 2011, *Handbook on Industrial Engineering equations, formulas and calculations*, CRC Press

2. Tristan Boutros and Tim Purdie 2014, *The Process Improvement Handbook: a Blueprint for Managing Change and Increasing Organizational Performance*, McGraw-Hill Education

3. Layna Fischer 2005, *Workflow Handbook 2005*, Future Strategies

4. Imre Hegedus 2012, *Business Process Management: Strategies to Improve*

Performance, Ark Group

5. Ricky W. Griffin 2013, *Management*, South-Western/Cengage Learning

6. James A. Tompkins, John A. White, Yavuz A. Bozer and J.M.A. Tanchoco 2010, *Facilities Planning*, 4th, Wiley

7. Alberto Garcia-Diaz and J. MacGregor Smith 2008, *Facilities Planning and Design*, Pearson/Prentice Hall

8. Gavriel Salvendy 2007, *Handbook of Industrial Engineering*, John Wiley & Sons, Third Edition Published Online

9. Raybould, E, R and Minter, A, L. 1992, *Problem Solving for Management*, Institute of Management Services, Latest Edition

10. Tomkins, White, Bozer, Frazelle, Tanchoo, Trevino. 2010, *Facilities Planning*, 4th edn, John Wiley & Sons Inc.

11. International Labour Office 1992, *Introduction to Work Study*, 4th edn

12. Lawrence, P (Editor) 1997, *Workflow Handbook*, John Wiley & Son, Chichester

13. Stefan Joablonski and Christoph Bussler 1996, *Workflow Management - Modeling Concepts, Architecture and Implementation*, International Thomson Computer Press

14. Poyssick, G and Hannaford, S. 1996, *Workflow Reengineering*, Adobe Press, Mountain View, California

Subject Code	ISE520
Subject Title	Manufacturing Strategy
Credit Value	3
Level	5
Pre-requisite/Co-requisite/Exclusion	Nil
Objectives	This subject provides students with 1. an understanding of the concept and criticalness of manufacturing strategy for industrial competitiveness; 2. the ability to apply principles and techniques in the identification, formulation, and implementation of manufacturing strategy for greater competitiveness in the societal and global context.
Intended Learning Outcomes	Upon completion of the subject, students will be able to a. understand the concept and the importance of manufacturing strategy for industrial enterprise competitiveness; b. apply the appropriate techniques in the analysis and evaluation of company's opportunities for enhancing competitiveness in the local, regional and global context; c. identify, formulate and implement strategies for manufacturing and therefore enterprise competitiveness.
Subject Synopsis/ Indicative Syllabus	1. <u>World-Class Manufacturing</u> Basic principles of manufacturing strategy. Manufacturing strategy concepts and domains. Relationship of manufacturing strategy with marketing and corporate strategies. Trade-offs in manufacturing objectives. Creating competitive advantages through manufacturing strategy. Competitiveness models. Formulation and implementation of manufacturing strategy. 2. <u>Manufacturing Decisions</u> Production system design. Market-led versus technology-led approaches. Product differentiation. Process positioning. Mass customisation. Focused manufacturing. Economics of integration. Continuous improvement. 3. <u>Performance Measurement Framework for Analysing Manufacturing Effectiveness</u> Measurement tools and techniques. Cost accounting-based measurement and non-financial performance. World-class manufacturing and bench marking. 4. <u>Manufacturing Strategy in the Global Context</u> Global management paradigm and the extended enterprise.

<table>
<tr><td></td><td>Internationalisation strategies and core competencies of cooperation. Alliance advantages and technology transfer.</td></tr>
<tr><td>Teaching/Learning Methodology</td><td>A mixture of lectures, tutorial exercises, laboratory exercises, and case studies is used to deliver the various topics in this subject for the attainment of the learning outcomes. Some material is covered using a problem-based format where this advances the learning objectives. Other material is covered through directed study to enhance the students' "learning to learn" ability. Case studies are used to integrate these topics and demonstrate to students how the various techniques are interrelated and applied in real-life situations. The cross fertilisation of the ideas and experiences of students regarding manufacturing strategy is encouraged through class discussions and presentations, and forms an important component in the teaching/learning process of this subject.</td></tr>
<tr><td>Assessment Methods in Alignment with Intended Learning Outcomes</td><td>
<table>
<tr><td rowspan="2">Specific assessment methods/tasks</td><td rowspan="2">% weighting</td><td colspan="6">Intended subject learning outcomes to be assessed</td></tr>
<tr><td>a</td><td>b</td><td>c</td><td></td><td></td><td></td></tr>
<tr><td>1. Assignments/Case studies/Presentations</td><td>30%</td><td>✓</td><td>✓</td><td>✓</td><td></td><td></td><td></td></tr>
<tr><td>2. Laboratory work</td><td>10%</td><td></td><td></td><td>✓</td><td></td><td></td><td></td></tr>
<tr><td>3. Final examination</td><td>60%</td><td>✓</td><td>✓</td><td>✓</td><td></td><td></td><td></td></tr>
<tr><td>Total</td><td>100%</td><td colspan="6"></td></tr>
</table>
The assignments, case studies, and presentations are used to assess students' ability to synthesise and apply the concepts and skills learnt in analysing and solving problems.
The laboratory work assesses students' ability to practice the techniques through tackling simulated real-life problem scenarios related to the exercise of manufacturing strategy.
The final examination assesses students' understanding of the concepts and skills in analysing and solving problems related to the subject.
</td></tr>
<tr><td>Student Study Effort Expected</td><td>
<table>
<tr><td>Class contact:</td><td></td></tr>
<tr><td>▪ Lectures 2 hours/week for 14 weeks</td><td>28 Hrs.</td></tr>
<tr><td>▪ Tutorials/Case studies/Laboratory work 1 hour/week for 14 weeks</td><td>14 Hrs.</td></tr>
<tr><td>Other student study effort:</td><td></td></tr>
<tr><td>▪ Study and self-learning</td><td>45 Hrs.</td></tr>
<tr><td>▪ Assignment and report writing</td><td>28 Hrs.</td></tr>
<tr><td>Total student study effort</td><td>115 Hrs.</td></tr>
</table>
</td></tr>
</table>

Reading List and References	1. Marcus, A A. 2011, *Management strategy: achieving sustained competitive advantage*, New York : McGraw-Hill/Irwin. 2. Thompson, A A, Strickland, A J Jr, Gamble, J E. 2007, *Crafting and executing strategy : text and readings*, New York : McGraw-Hill/Irwin, c2007. 3. Water, D. 2006, *Operations Strategy*, London: Thomson Learning 4. Hitt, M A, Ireland, R D & Hoskisson, R E. 2009, *Strategic Management: Competitiveness and Globalization: Concepts & Cases*, Mason, Ohio: South-Western Cengage Learning 5. Van Mieghem, J A. 2008, Operations S*trategy: Principles and Practice*, Belmont, Mass: Dynamic Ideas 6. Miltenburg, J. 2005, *Manufacturing Strategy: How to Formulate and Implement a Winning Plan*, New York: Productivity Press 7. Hussey, D E. 1998, *Strategic Management: from Theory to Implementation*, 4th edn, Oxford: Butterworth-Heinemann 8. Hill, T. 1993, *Manufacturing Strategy*, 2nd edn, The MacMillan Press 9. Hill, T. 2000, *Manufacturing Strategy: Text and Case*, Boston: Irwin 10. Hayes, R H & Wheelwright, S C. 1984, *Restoring Competitive Edge, Competing through Manufacturing*, John Wiley & Son 11. International Journal of Operations and Production Management 12. Journal of Business Strategy 13. Harvard Business Review

<table>
<tr><td>Subject Code</td><td>ISE529</td></tr>
<tr><td>Subject Title</td><td>Dissertation</td></tr>
<tr><td>Credit Value</td><td>9</td></tr>
<tr><td>Level</td><td>5</td></tr>
<tr><td>Pre-requisite / Co-requisite/ Exclusion</td><td>After the completion of the fourth subject with a GPA at 2.5 or above.</td></tr>
<tr><td>Objectives</td><td>The explicit objectives of each project will be vary but in general, the dissertation will provide students with:

1. the competence in conducting research and development.
2. the skills in applying advanced knowledge/theory to solve a problem.</td></tr>
<tr><td>Intended Learning Outcomes</td><td>Upon completion of the dissertation, students will be able to:

a. conduct presentation regarding the overall work done in a logical manner.

b. have good time control in the project period and the work performed is up to standard.

c. compile a dissertation that should be an exposition of a student's own work and ideas, and is qualified for the Master degree.</td></tr>
<tr><td>Teaching/Learning Methodology</td><td>The student and academic supervisor should contact each other from time to time to discuss the progress. The academic supervisor will provide guidance to the student and advice on the style of dissertation presentation, etc. Academic and professional supervisors will liaise as circumstances require. The academic supervisor will be available for consultation at the University/at the student's workplace according to circumstances.

A professional supervisor is to be able to assess the student’s effort in the workplace, assist in the conduct of the oral examination, and provide assurance that the student's work has been independently done. If the work for the dissertation forms part of a group endeavor within the student's organization, it is essential that the student's personal contribution can be identified and that the professional supervisor can speak for the part which the student has played.

In cases where no suitable professional supervisor can be found, a student may find a second academic supervisor to take the place of the professional supervisor. If the dissertation topic is based in the student's workplace, visits to the student's place of work by the academic supervisor(s) will be necessary.
<table>
<tr><td rowspan="2">Teaching/Learning Methodologies</td><td colspan="3">Intended Subject Learning Outcomes to be assessed</td></tr>
<tr><td>a</td><td>b</td><td>c</td></tr>
<tr><td>Project</td><td>✓</td><td>✓</td><td>✓</td></tr>
</table>
</td></tr>
</table>

Assessment Methods in Alignment with Intended Learning Outcomes

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)				
		a	b	c	d	e
1. Oral Exam	30%	✓				
2. Progress	20%		✓			
3. Dissertation	50%			✓		
Total	100 %					

Student Study Effort Required

Class contact:	
▪ Meeting and Oral Presentation	20 Hrs.
Other student study effort:	
▪ Project/Research work	250 Hrs.
▪ Dissertation writing	90 Hrs.
Total student study effort	360 Hrs.

Reading List and References

1. Blaxter, L., et al (2001) *How to research*, 2nd edition, Open University Press.
2. Bryman, A. (1989) *Research Methods and Organization Studies*, Routledge.
3. Campbell, W.G., et al (1990) *Forms and Style: Thesis, reports, term papers*, 8th ed., Boston, Houghton Mifflin.
4. Murray, Rowena (2002) *How to write a thesis*, Open University Press.

Subject Code	ISE548
Subject Title	Risk and Crisis Management
Credit Value	3
Level	5
Pre-requisite/Co-requisite/Exclusion	Nil. However, knowledge of elementary business statistics and probability, as well as information systems for supply chain management, is preferred.
Objectives	This subject enables student to 1. master quantitative and qualitative skills necessary to strike a balance between risk and opportunity in tailoring risk mitigation for logistics systems; 2. appreciate the importance of injecting a risk culture into the organization and of identifying critical factors for implementing an organization-wide risk and crisis management strategy; 3. advocate a customer-centric Business Continuity Plan (BCP) as a marketing tool and align it with contemporary risk mitigation strategy; 4. apply and embed best practices of information system security into logistics information systems.
Intended Learning Outcomes	Upon completion of the subject, students will be able to a apply risk modeling assignment methods to evaluate the level of risk of the logistics systems; b identify how logistics systems should be configured to balance risk/reward; c implement the BCP in a practical situation to mitigate risk; d apply the skills in articulating the requirement of process and procedures for building enterprise-wide risk management.
Subject Synopsis/ Indicative Syllabus	1. <u>Risk Modeling and Management</u> Step-by-step approach in building qualitative and/or quantitative model for analysis, design, and evaluation of logistics system for mitigating risk; Application of hierarchical holographic modeling (HHM) for risk identification; Partition risk impact to select the best risk mitigation strategy based on multi-objective risk impact analysis. 2. <u>Crisis Management and Risk Audit</u> Logistics project risk management; Tracking and identifying the patterns and sources of risk; Principle of balancing risk/reward relationships; Establishing processes for emergency response, escalation, and preventive measures.

	3. <u>Business Continuity Planning</u> Strategic issues and case studies drawn from logistics service providers to highlight various topics on outsourcing and quality management issues; Disaster recovery planning; Information security management practices, including planning and audit of information systems.
Teaching/Learning Methodology	A mixture of lectures, tutorial exercises, case studies, and assignments are used to deliver the concept and application of risk and crisis management, with an emphasis on risk mitigation and balancing risk/reward. Lectures are the primary vehicle used to deliver the concept of risk and crisis management, and to teach the various quantitative and qualitative risk analysis methods. Case studies are used to integrate theories in practice and review contemporary issues and best practices of customer-centric BCP.

Teaching/Learning Methodologies	Intended Subject Learning Outcomes to be assessed			
	a	b	c	d
Lecture	✓	✓	✓	✓
Case Study	✓	✓		✓
Project	✓		✓	✓

Assessment Methods in Alignment with Intended Learning Outcomes

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed			
		a	b	c	d
1. Test	20%	✓	✓		✓
2. Project	40%	✓		✓	✓
3. Assignment	40%	✓	✓	✓	✓
Total	100%				

The test is designed to assess students' understanding of the topics and whether or not they can present the concepts clearly.

The project is designed to assess students' skills in applying different risk models, implementing BCP, and articulating the requirement of process and procedures for building enterprise-wide risk management through different case studies and group projects.

Assignments are designed to assess students' ability in identifying how the logistics systems should be configured to balance risk/reward and to implement the BCP in a practical situation for risk mitigation.

Student Study Effort Expected		
	Class contact:	
	▪ Lecture/Seminars	30 Hrs.
	▪ Tutorial/Case studies	9 Hrs.
	Other student study effort:	
	▪ Self learning and practice for project	27 Hrs.

	▪ Assignment and report writing	40 Hrs.
	Total student study effort	106 Hrs.
Reading List and References	Textbook: Haimes, Y, Y. 2011, *Risk Modeling, Assessment, and Management*, Wiley, New York Indicative Reading: 1. Bastrom, N and Cirkovic, M, M. 2008, *Global Catastrophic Risks*, Oxford University Press, Oxford 2. Fraser, J and Simkins, B. 2009, *Enterprise Risk Management: Today's Leading Research and Best Practices for Tomorrow's Executives*, Wiley, New York 3. Snedaker, S. 2011, *Business Continuity and Disaster Recovery Planning for IT Professionals*, Butterworth-Heinemann	

Subject Code	ISE550
Subject Title	Contemporary Logistics Issues in China
Credit Value	3
Level	5
Pre-requisite/Co-requisite/Exclusion	Nil
Objectives	This subject provides students with 1. the latest social, technical, and economic issues of the logistics industry in China; 2. the essential factors in building a contemporary logistics system. 3. the environment to perform a competitive benchmark evaluation and put into practice the key concepts and frameworks in formulating contemporary logistics systems in China.
Intended Learning Outcomes	Upon completion of the subject, students will be able to a. understand the latest social, technical, and economic issues of the logistics industry in China; b. identify essential components in building a contemporary logistics system; c. conduct a logistics systems portfolio analysis.
Subject Synopsis/ Indicative Syllabus	1. <u>Introduction</u> Contemporary issues on the development of logistics in Mainland China; Various logistics operations and logistics information management system; Logistics and custom in China. 2. <u>Contemporary Logistics Issues</u> Infrastructure, law, organization, business practice, logistics network and operations; Logistics management in China; Business logistics and human resource management; Operations research and logistics; Relationship between logistics and business law in China. 3. <u>Comparison of Logistics Practices</u> Comparative study of logistics practices between Hong Kong and China; Logistics in large enterprise; Planning of logistics services in China.
Teaching/Learning Methodology	A mixture of lectures, case studies, and site visits in China is used to deliver the various topics in this subject, some of which are covered in a problem-based format where learning objectives are enhanced. Other topics are covered through directed study to enhance students' "learning to learn" ability. Some case studies based on on-site case studies are used to integrate these topics and thus demonstrate to students how various issues are interrelated and how they apply in real-life situations. The students are required to formulate a study plan

to focus on achieving the goal of the field trip. Desktop research is required to gather information about the organizations to be visited, its competitors, and the markets concerned.

Teaching/Learning Methodologies	Intended Subject Learning Outcomes to be assessed		
	a	b	c
Lecture	✓	✓	
Seminars	✓	✓	✓
Case studies		✓	✓

Assessment Methods in Alignment with Intended Learning Outcomes

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed		
		a	b	c
1. Individual write-up of background knowledge	10%	✓	✓	✓
2. Individual literature review report	20%	✓	✓	✓
3. Individual research report	30%	✓	✓	✓
4. Final group field project report	30%	✓	✓	✓
5. Oral presentation of findings	10%	✓	✓	✓
Total	100%			

Individual assignments are designed to appraise students' recommendations in building a contemporary logistics system. The project report and presentation are designed to reflect students' understanding on the theories taught. The quiz is designed to measure students' depth of knowledge in the latest social, technical, and economic issues of the logistics industry in China.

Student Study Effort Expected

Class contact:	
▪ Lectures	9 Hrs.
▪ Tutorial/Seminar/Case studies	6 Hrs.
▪ Site visits	24 Hrs.
Other student study effort:	
▪ Preparation for visits and information gathering	26 Hrs.
▪ Preparation for the project presentation and report writing	60 Hrs.
Total student study effort	125 Hrs.

Reading List and References	1. Donald Waters, 2010, *Global logistics: new directions in supply chain management*, London ; Philadelphia : Kogan Page, c2010 2. Beijing Shi : Dang dai Zhongguo chu ban she ; Xianggang : Xianggang zu guo chu ban she, 2009, *Contemporary China. Armed forces logistics*, 北京市 : 當代中國出版社 ; 香港 : 香港祖国出版社 3. John Gattorna, 2009, *Dynamic supply chain alignment: a new business model for peak performance in enterprise supply chains across all geographies*, Farnham, England ; Burlington, VT : Gower Pub. 4. Cheng Jin, 2007, *Maritime policy in China after WTO : legal & economic approach*, Hong Kong : Dept. of Logistics, The Hong Kong Polytechnic University 5. Lee, Tae-Woo, 2002, *Shipping in China*, Aldershot; Burlington, VT : Ashgate, c2002 6. Koh, S. C. L.; Tan, Z., 2005, *Using e-commerce to gain a competitive advantage in 3PL enterprises in China*, International Journal of Logistics Systems and Management, 9 January 2005,, Vol. 1, No. 2-3, pp. 187-210 7. *China logistics directory*, 2008, Hong Kong : SinoMedia Ltd., 8. *Logistics in China*, 2008, New York ; London : Datamonitor Plc

Subject Code	ISE553
Subject Title	Managing Six Sigma
Credit Value	3
Level	5
Pre-requisite/Co-requisite/Exclusion	Students must be aligned with an organisation to complete a mini-project with real objectives and data collection and analysis. Experience in QC, QA, quality management, process control, or other operational activities is desirable.
Objectives	This subject will provide students with 1. the basic Six Sigma skills for identifying and defining improvement projects that will have significant positive impacts on sustainable business performance; 2. skills in the measurement and analysis of process data and a basic understanding of the techniques and importance of process modelling in manufacturing and service industries to improve the existing processes; 3. the ability to use Six Sigma practices and techniques so that they can effectively support the implementation of a company-wide improvement programme; 4. knowledge of the alternative and latest Six Sigma methodologies, to enable them to evaluate and determine the best choices for a company.
Intended Learning Outcomes	Upon completion of the subject, students will be able to a. examine the existing work situation in a manufacturing or service organisation to identify Six Sigma projects that will significantly improve customer satisfaction, and quality and productivity; b. apply appropriate Six Sigma techniques to improve existing or design new work methods and procedures for a business process; c. select appropriate Six Sigma measurement and data analysis techniques and apply them to improve the value of products and services delivered to customers while enhancing the organisation's financial performance; d. apply appropriate Six Sigma techniques to support the implementation of a company-wide improvement programme; e. understand the concepts and applicability of alternative Six Sigma methodologies with a view to determining the appropriate one for application in specific settings.
Subject Synopsis/ Indicative Syllabus	1. <u>Background and Fundamentals</u> What Six Sigma is; Six Sigma goals and metrics including customer satisfaction, process efficiency, and time-to-market; Six Sigma applications; models of improvement: DMAIC, DFSS.

2. Implementation

Six Sigma leadership; enterprise-wide deployment; business process management; project charter; project selection and evaluation; team work.

3. Techniques

Critical to quality (CTQ); objective function; quality function deployment (QFD); process mapping; capability studies and statistical process control; multivariate analysis; failure mode, effects, and criticality analysis (FMECA); visual management brainstorming tools.

4. Latest Advances

Lean Six Sigma; Kaizen events; conquering complexity; beyond Six Sigma.

Teaching/Learning Methodology

A mixture of lectures, tutorial exercises, and case studies is used to deliver the various topics in this subject. Some material is covered using a problem-based format where this advances the learning objectives. Other material is covered through directed study to enhance students' self-learning ability. External speakers are invited to deliver some case studies, largely based on consultancy experience, to integrate the topics covered and demonstrate how the various tools are applied in real-life situations.

Teaching/Learning Methodologies	Intended Subject Learning Outcomes to be assessed				
	a	b	c	d	e
Lecture	✓	✓	✓	✓	✓
Tutorial	✓	✓	✓	✓	✓
Seminar	✓	✓	✓	✓	✓
Case study	✓	✓	✓	✓	

Assessment Methods in Alignment with Intended Learning Outcomes

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed				
		a	b	c	d	e
1. Mini-project	60%	✓	✓	✓	✓	✓
2. Case studies	15%	✓	✓	✓	✓	
3. Test	25%	✓	✓	✓	✓	✓
Total	100%					

Assessment comprises tasks with individual and group components, usually one test, group case studies, and one individual mini-project with an oral presentation and written report. All assessment components require students to apply what they have learnt to address real-world issues.

Student Study Effort Expected	Class contact:	
	▪ Lectures/Seminars (block mode)	28 Hrs.
	▪ Tutorials/Case studies	6 Hrs.
	▪ Presentation and peer review	5 Hrs.
	Other student study effort:	
	▪ Studying and self-learning; test preparation	40 Hrs.
	▪ Mini-project work; case study report writing	40 Hrs.
	Total student study effort	119 Hrs.
Reading List and References	1. Pende, Peter S., Neuman, Robert P. and Cavanagh, Roland R. 2000, *The Six Sigma Way: How GE, Motorola, and Other Top Companies are Honing their Performance*, McGraw Hill 2. Bill Wortman 2007, *Six Sigma Black Belt Primer*, Quality Council of Indiana 3. Devane, Tom 2004, *Integrating Lean Six Sigma and High Performance Organizations*, Pfeiffer Publishing 4. Eckes, George 2001, *Making Six Sigma Last: Managing the Balance between Cultural and Technical Change*, Wiley 5. *Six Sigma Forum Magazine*, ASQ	

Subject Code	ISE5001
Subject Title	Technology Transfer and Commercialization
Credit Value	3
Level	5
Pre-requisite / Co-requisite/ Exclusion	none
Objectives	This subject is aimed to provide the students with: 1. the theory and practice of technology transfer and commercialization. 2. working knowledge and skills to plan and implement technology assessment, market assessment, alignment of technology in technology transfer and transmission process. 3. understanding on issues concerning roles of various intellectual property rights, patent search, sustainability and competitive advantage, science and technology policy, start-up, and licensing and spin-off companies.
Intended Learning Outcomes	Upon completion of the subject, students will be able: a. to apply appropriate mechanisms of technology transfer and commercialization b. to understand and assess customer-needs driven technology specifications, technology alignment, and technology transfer process c. to assess technology licensing agreement and to evaluate start-up and spin-off companies d. to recognise the importance and role of intellectual property rights, government, research institutes and commercial institutions in technology transfer and commercialization
Subject Synopsis/ Indicative Syllabus	The topics to be covered include: <u>1. Theory and practice</u> Technology Entrepreneurship and Innovation; Technology Transfer & Transmission Process; Technology Commercialization Process; Role of Intellectual Property in Protecting Innovation <u>2. Technology and Market Assessment</u> Customer Needs Driven Product Specifications; Negotiating the Deal and Marketing the Innovation; Financial Plan and Selection of Innovation Projects; Innovation and Risk Management; Technology Valuation and Impact Analysis; Market Assessment and Alignment of Technology. <u>3. Commercialization Strategy</u> Coming Full Circle in the Commercialization Loop; Business Plan Science and

<table>
<tr><td></td><td>Technology Policy; Negotiating and Monitoring the Licensing Agreement; Start-Up and Spin-Off Companies; Joint Venture.

<u>4. Case Studies</u>
Case studies drawn from commercial, industrial and research applications.</td></tr>
<tr><td>Teaching/Learning Methodology</td><td>This subject is offered in block mode format on weekends, usually spread over a month. A mixture of lectures, tutorial exercises, and case studies will be used to deliver the various topics in this subject. Some of the topics will be covered in a problem-based format where this enhances the learning objectives. Others will be run as project-based, whereby students will learn and apply the knowledge and techniques to solving real problems. The subject also emphases experiential learning offered by industrial leaders.</td></tr>
<tr><td>Assessment Methods in Alignment with Intended Learning Outcomes</td><td>
<table>
<tr><td rowspan="2">Specific assessment methods/tasks</td><td rowspan="2">% weighting</td><td colspan="6">Intended subject learning outcomes to be assessed (Please tick as appropriate)</td></tr>
<tr><td>a</td><td>b</td><td>c</td><td>d</td><td></td><td></td></tr>
<tr><td>1. Individual Assignment</td><td>25 %</td><td></td><td>✓</td><td></td><td>✓</td><td></td><td></td></tr>
<tr><td>2. In-class exercises</td><td>20 %</td><td>✓</td><td></td><td>✓</td><td></td><td></td><td></td></tr>
<tr><td>3. Quiz and Test</td><td>35%</td><td>✓</td><td>✓</td><td>✓</td><td></td><td></td><td></td></tr>
<tr><td>4. Individual presentation for mini-project</td><td>10 %</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td><td></td><td></td></tr>
<tr><td>5. mini-project report</td><td>10 %</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td><td></td><td></td></tr>
<tr><td>Total</td><td>100 %</td><td colspan="6"></td></tr>
</table>
This is a 100% continuous assessment subject which is comprised of assignments with individual and group components, mini-project and usually two tests. All assessment components will require students to apply what they have learnt to realistic work applications.

To assess the learning outcomes (a) to (b) of the students, the students are required to form a group to work on a mini-project. The students are provided with a simulated environment for demonstrating their understanding and capability in integrating and applying concepts and skills learnt in the class in analyzing, solving problems in real life.

The individual assignment allows the students to reflect their understanding of the topics expected in learning outcome (b) and (d).

The in-class exercises allow the students to give quick feedback on applying and practicing the techniques learnt in the classes for learning outcomes (a) and (c).

There are a quiz and a test which aim to assess the overall understanding of the student for the concepts and knowledge necessary for achieving learning outcomes (a) to (d)</td></tr>
<tr><td>Student Study</td><td>Class contact:</td><td></td></tr>
</table>

Effort Required	▪ Lectures	28 Hrs.
	▪ In-class activities/Tutorial	14 Hrs.
	Other student study effort:	
	▪ Study and self learning including mini-project and preparation for mini-project presentation	38 Hrs.
	▪ Assignment and report writing	25 Hrs.
	Total student study effort	105 Hrs.
Reading List and References	1. Clifford, M. Gross and Joseph P. Allen, (2003) "Technology Transfer for Entrepreneurs – A Guide to Commercializing Federal Laboratory Innovation", Praeger Publishers, USA. 2. Cohen, M. W., "Patents and Appropriation_ Concerns and Evidence", Journal of Technology Transfer, 30(1&2): 57-71, 2005. 3. Cooke, I. and Mayes, P. (1996), Introduction to Innovation and Technology Transfer, Norwood: Artech House. 4. Dorf, R.C. (1999), The Technology Management Handbook, Boca Raton, Fla.: CRC Press. 5. Eskelin, A. (2001), Technology Acquisition: Buying the Future of your Business, Boston, Mass.: Addison-Wesley. 6. Farris, G.F., "Research in Innovation Management and Technology Transfer in China", The Journal of Technology Transfer, 32(1-2) 123-126, April 2007. 7. Iansiti, M. (1998), Technology Integration: Making Critical Choices in a Dynamic World, Mass.: Harvard Business School. 8. Inzelt, A. and Hilton, J. (1999), Technology Transfer: From Invention to Innovation, Kluwer Academic, Norwell. 9. Jolly, V.K (1997), Commercialisation of New Technologies, Greeting from Mind to Market, Boston, Mass.: Harvard Business School Press. 10. Melissa, A. Schilling (2008), Strategic Management of Technology Innovation, Micraw-Hill International Edition, 2nd Edition, Singapore. 11. Muir, A.E. (1997), The Technology Transfer System, New York: Latham Book Publishing. 12. Parr, R.L. and Sullivan, P.H. (1996), Technology Licensing: Corporate Strategies for Maximizing Value, New York: John Wiley & Sons. 13. Paulson, E. (2001), The Technology M&A Guidebook, New York: John Wiley & Sons. 14. Megantz, R.C. (2002), Technology Management: Developing and Implementing Effective Licensing Programs, New York: John Wiley & Sons. 15. Spencer, R.H. (2003), Technology Best Practices, New York: John Wiley & Sons. 16. Timmons, J.A. (2003), New Venture Creation, Sixth edition, Chicago: Irwin. 17. Protecting Innovations by Utility Models (http://www.wipo.int/sme/en/ip_business/utility_models/utility_models.htm). 18. NASA's Technology Transfer Spin-Out Process (http://ipp.gsfc.nasa.gov/resources-ttprocess2.html). 19. Ramsey. W.S., "Financing a New Venture", http://www.williamramseylaw.com/pages/Pfinancing.html

Subject Code	ISE5019
Subject Title	Optimization Modeling and Applications
Credit Value	3
Level	5
Pre-requisite/Co-requisite/Exclusion	Nil
Objectives	This subject provides students with 1. the value of optimization and mathematical modeling in real life; 2. basic modeling techniques to formulate a real problem into a mathematical model; 3. various techniques and tools to solve mathematical models; 4. the ability to apply various optimization models, such as linear programming and other mathematical programming, to solve practical problems, especially, logistics problems.
Intended Learning Outcomes	Upon completion of the subject, students will be able to a. analyze real-life problems, especially, logistics problems, through the use of mathematical modeling techniques; b. gain familiarity with various modeling techniques to build mathematical models for real problems; c. employ some optimization methods and techniques and apply them to some practical problems.
Subject Synopsis/ Indicative Syllabus	1. <u>Introduction</u> Introduction to optimization and mathematical modeling: concepts, modeling, various mathematical models. 2. <u>Modeling Techniques</u> Techniques in building mathematical models; Various methods to interpret a real-world problem in mathematical terms and formats. 3. <u>Solution Methods</u> Methods to solve mathematical models: linear programming, integer programming, and network models. 4. <u>Applications</u> Applications of optimization models and methods: the traveling salesman problem, the vehicle routing problem, and others.

Teaching/Learning Methodology

A mixture of lectures, tutorial exercises, and laboratories are used to deliver the various topics in this subject, some of which are covered in a problem-based format where the learning objectives are enhanced. Others are covered through directed study to enhance the students' "learning to learn" ability. Some case examples, largely based on consultancy experience, are used to integrate these topics and thus demonstrate to students how the various techniques are interrelated and how they can be applied to real-life situations or logistics operations.

Teaching/Learning Methodologies	Intended Subject Learning Outcomes to be assessed		
	a	b	c
Lecture	✓	✓	✓
Seminars	✓	✓	✓
Project/case studies	✓	✓	✓

Assessment Methods in Alignment with Intended Learning Outcomes

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed		
		a	b	c
1. Exercises	30%	✓	✓	✓
2. Project report	10%	✓	✓	✓
3. Presentation	10%	✓	✓	✓
4. Lab and report	20%	✓	✓	✓
5. Test	30%	✓	✓	✓
Total	100%			

Continuous assessment comprises of tasks with individual and group components, usually several exercises, a mini-project with oral presentation and written report, a laboratory, and a test. All assessment components require students to apply and demonstrate what they have learned from the subject to address issues related to optimization modeling and applications.

Student Study Effort Expected

Class contact:	
▪ Lectures	30 Hrs.
▪ Laboratory, presentation, test	9 Hrs.
Other student study effort:	
▪ Preparation and review, self-study	63 Hrs.
▪ Project report writing	18 Hrs.
Total student study effort	120 Hrs.

Reading List and References

1. Williams, H, P. 1993, *Model Building in Mathematical Programming*, John Wiley & Sons

	2. Schrage, L. 1997, *Optimization Modeling with Lindo*, 5th edn, Thomson 3. Rardin, R. 2000, *Optimization in Operations Research*, Prentice Hall 4. Nash, S and Sofer, A. 1996, *Linear and Nonlinear Programming*, McGraw-Hill 5. Nemhauser, G and Wolsey, L, A. 1999, *Integer and Combinatorial Optimization*, John Wiley & Sons 6. Griva, I, Nash, S, G and Sofer, A. 2009, *Linear and Nonlinear Optimization*, Society of Industrial and Applied Mathematics 7. Alba, E. 2009, *Optimization Techniques for Solving Complex Problems*, John Wiley 8. Floudas, C, A and Pardalos, P, M. 2009, *Encyclopedia of Optimization*, Springer

Subject Code	ISE5021
Subject Title	Technology Project Management
Credit Value	3
Level	5
Pre-requisite/Co-requisite/Exclusion	Students who have taken Project Management or equivalent are not advised to take this subject.
Objectives	This subject aims to equip the students with 1. theory and practices of leaderships in Project Management in different industrial areas and the methods and skills for applying project management tools; 2. working knowledge of the Project Management in industry in terms of time-cost relationships, resources, processes and risks to the projects and the ability to select the essential elements and practices needed to develop and implement projects using system approach; 3. the ability to carry out analysis and evaluation of the best practices of projects.
Intended Learning Outcomes	Upon completion of the subject, students will be able to a. apply advanced project management tools in managing technology projects; b. apply the working knowledge of the project methodologies to the projects; c. select the essential elements and practices needed to develop and implement projects using system approach; d. evaluate of the best practices in managing technology projects.
Subject Synopsis/ Indicative Syllabus	1. <u>Project management fundamentals</u> Project concepts, scope, objectives, agreements and the relationship with other stakeholders; Project management and people skills; Project formulation and implementation strategy; Projects in Organizations 2. <u>Project time/cost management</u> The methodology in terms of work breakdown structure (WBS), organizational breakdown structure (OBS), controlling and managing of time, cost and resources; Overall project scheduling, budgeting, resource planning and monitoring; Software tools (e,g. MS Project); Project life cycle; Providing service monitoring and performance indicators.

3. Control and Evaluation

Fundamental purposes of control; control process and systems; Control projects according to plan; evaluating a project and project audit.

Essentials of Audit and Evaluation

4. Project Risk management

Risk identification, response development and control; emergency change response and control.

5. Case study and management report

Teaching/Learning Methodology

A mixture of lectures, tutorial exercises, and case studies will be used to deliver the various topics in this subject for the attainment of learning outcomes. Cross fertilization of ideas and experiences of subject lecturers and students in project strategy through class discussions and presentations will be highly encouraged and should form an important component in the teaching/learning process of this subject.

Two major portions:

Lectures will cover the direct study of the various topics in this subject to enhance students' "ability to learn".

Problem-based Learning approach will be applied to the case studies and tutorial exercises and include industrial technology applications.

An integrated group project will be conducted and presented by students to demonstrate the ability to integrate various techniques of project management in industry, and how they can be applied in real life situations.

Teaching/Learning Methodologies	Intended Subject Learning Outcomes to be assessed			
	a	b	c	d
Lecture	✓	✓	✓	✓
Tutorial	✓	✓		
Case studies	✓	✓	✓	✓

Assessment Methods in Alignment with Intended Learning Outcomes

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed			
		a	b	c	d
1. Group project and report	30 %	✓	✓	✓	✓
2. Individual assignment	30 %	✓	✓	✓	✓
3. Quiz and tests	30 %	✓	✓	✓	
4. Project presentation	10 %		✓	✓	
Total	100%				

The coursework of this subject involves students to work as individual and in groups (role play) to study cases that mimic the realities of project

<table>
<tr><td></td><td colspan="2">management situations in industry (Learning outcomes; a, b, c, and d). Through such exercises and tests (Learning outcomes: b, c, and d), students' ability to apply and synthesize acquired knowledge can be assessed on the basis of their performance (role play) in group discussion, oral presentations (Learning outcomes: c, and d), and the quality of their written reports on these case studies.</td></tr>
<tr><td rowspan="8">Student Study Effort Expected</td><td>Class contact:</td><td></td></tr>
<tr><td>▪ Lectures and discussion</td><td>27 Hrs.</td></tr>
<tr><td>▪ Tutorial and case study</td><td>12 Hrs.</td></tr>
<tr><td>Other student study effort:</td><td></td></tr>
<tr><td>▪ Research and preparation</td><td>60 Hrs.</td></tr>
<tr><td>▪ Report writing</td><td>17 Hrs.</td></tr>
<tr><td>Total student study effort</td><td>116 Hrs.</td></tr>
<tr><td></td><td></td></tr>
<tr><td>Reading List and References</td><td colspan="2">1. Garton, C. 2005, Fundamentals of Technology Project Management, MC Press

2. Ghattas, R.G. & McKee S. L 2001, Practical Project Management, Prentice Hall

3. Gray, C. & Larson, E. 2003, Project Management, McGraw-Hill

4. Heizer, J. & Render, B. 1993, Production and Operations Management – Strategies and Tactics, 6th edn, Allyn and Bacon

5. Kerzner, H. 2009, Project Management: A Systems Approach to Planning, Scheduling, and Controlling, John Wiley & Sons Inc

6. Morse, L. et al. 2006, Managing Engineering and Technology, Prentice Hall

7. Project Management Institute 2013, A Guide to the Project Management Body of Knowledge, 5th ed., Project Management Institute (PMI)

8. Smith, N.J. 2008, Engineering Project Management, Oxford: Blackwell Science</td></tr>
</table>

Subject Code	ISE5606
Subject Title	Business Intelligence and Data Mining
Credit Value	3
Level	5
Pre-requisite/Co-requisite/Exclusion	Students must have basic mathematical skills.
Objectives	This subject enables student to 1. master the basics in business intelligence (BI), data mining (DM), and knowledge discovery in databases; 2. learn the role that software tools/applications play in BI and DM, with emphasis on industrial case studies and practical applications; 3. Have an overall understanding of the major issues and applications in business intelligence and data mining, including a basic grasp of the algorithm classes and best practices for building successful BI projects.
Intended Learning Outcomes	Upon completion of the subject, students will be able to a. examine the concepts of data warehousing and OLAP; b. apply the concepts of BI and DM techniques for clustering, association, and classification; c. understand the operation procedures of BI projects in an organization; d. select appropriate DM tools and methods to manipulate and achieve data; e. apply DM concepts for formulating business strategies and programs to enhance business intelligence.
Subject Synopsis/ Indicative Syllabus	The syllabi of this subject are: 1. <u>Business Intelligence (BI)</u> Introduction to BI, BI concepts, and methods; Nature and representation of data; Building data warehouses; Data marts; OLAP; Concepts in data analysis, reporting, and analytics; Defining BI objectives; Maintenance of data infrastructure; Successful design methodology; Measuring and refining success. 2. <u>Data Mining and Knowledge Discovery in Databases (DM and KDD)</u> Introduction to data mining; Data mining algorithms; Predictive methods; Descriptive methods; Scalability considerations; Integration with DBMS and data warehouses; Lifecycle of data mining; Embedding data mining in business solutions; Example applications; Challenges and special considerations. 3. <u>Case Studies</u>

<table>
<tr><td></td><td>Case studies drawn from commercial, industrial, and research applications. These include eBusiness applications, cross-sell and up-sell methods; Fraud detection; Market prediction and forecasting.

In this subject, the techniques and methods covered are applied to both intra-organizational data and market data (e.g., industry statistics, trends, and competitive information). Enterprise as well as market-oriented applications are covered.</td></tr>
<tr><td>Teaching/Learning Methodology</td><td>Learning is facilitated through face to face lecturing and guided learning. Face-to-face seminars/labs are available to facilitate students' learning. The integrated application-oriented mini-project is designed to help students acquire the knowledge of understanding and using different BI and DM principles, techniques, and tools to solve a real problem through team work.
<table>
<tr><td rowspan="2">Teaching/Learning Methodologies</td><td colspan="5">Intended subject learning outcomes to be assessed</td></tr>
<tr><td>a</td><td>b</td><td>c</td><td>d</td><td>e</td></tr>
<tr><td>Lecture</td><td>√</td><td>√</td><td></td><td>√</td><td>√</td></tr>
<tr><td>Tutorial/Labs</td><td></td><td>√</td><td></td><td></td><td></td></tr>
<tr><td>Projects</td><td></td><td></td><td>√</td><td>√</td><td>√</td></tr>
<tr><td>Case Studies</td><td>√</td><td></td><td>√</td><td></td><td></td></tr>
</table></td></tr>
<tr><td>Assessment Methods in Alignment with Intended Learning Outcomes</td><td>
<table>
<tr><td rowspan="2">Specific assessment methods/tasks</td><td rowspan="2">% weighting</td><td colspan="5">Intended subject learning outcomes to be assessed</td></tr>
<tr><td>a</td><td>b</td><td>c</td><td>d</td><td>e</td></tr>
<tr><td>1. Assignment/ Test</td><td>25%</td><td>✓</td><td>✓</td><td>✓</td><td></td><td></td></tr>
<tr><td>2. Mini-project/ project presentation</td><td>20 %</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td><td></td></tr>
<tr><td>3. Exam</td><td>55 %</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td></tr>
<tr><td>Total</td><td>100 %</td><td colspan="5"></td></tr>
</table></td></tr>
<tr><td>Student Study Effort Expected

(Block Mode/ Evening Mode)</td><td>
<table>
<tr><td>Class contact:</td><td></td></tr>
<tr><td>Lectures/ seminars/ labs</td><td>26 hrs</td></tr>
<tr><td>Presentation/ test/case studies/project discussion</td><td>13 hrs</td></tr>
</table></td></tr>
</table>

	Other student study effort:	
	▪ Study of materials for exercises/assignments	28 Hrs.
	▪ Preparation and revision for in class test	28 Hrs.
	▪ Project and presentation preparation	28 Hrs.
	Total student study effort	123 hrs
Reading List and References	1. Jiawei Han, Micheline Kamber and Jian Pei, 2012, *Data Mining: Concepts and Techniques*, 3rd Edition, Morgan Kaufmann *2.* Jerzy Surma, 2011, *Business Intelligence: Making Decisions through Data Analytics*, New York, N.Y., Business Expert Press 3. Pang-Ning Tan, 2006, *Introduction to Data Mining*, Boston : Pearson Addison Wesley	

Subject Code	ISE5607
Subject Title	E-Learning Technologies and Practices
Credit Value	3
Level	5
Pre-requisite/Co-requisite/Exclusion	Completing the subjects ISE542 Managing Knowledge **or** ISE543 Methods and Tools for Knowledge Management Systems **is required**
Objectives	This subject provides students with the knowledge to 1. understand the prevalent models of electronic learning, development of learning strategies, and construct business cases; 2. appreciate the general and niche applications of electronic learning; 3. explore the existing and emerging technologies, systems and practices that underpin/impact the formulation and deployment of electronic learning and assess their implications.
Intended Learning Outcomes	Upon completion of the subject, students will be a. equipped with capabilities and understanding of e-learning concepts and models to plan for e-learning courses, representations, interactions, and technologies; b. equipped with evaluation and deployment capabilities and understanding of specific emerging e-learning technologies, systems and practices; c. equipped with strategic and management capabilities and insights in applying and sustaining e-learning within the enterprise; d. able to facilitate the personal mastery of being an e-learning practitioner with continuous awareness on e-learning environment and issues, and proficiency in technologies, systems, practices, projects, and other e-learning efforts.
Subject Synopsis/ Indicative Syllabus	1. <u>E-Learning Strategic Issues</u> E-learning environment and rationale; Policy issues; Stakeholder requirements; Business model and process needs; Risks; Learning Scenarios. 2. <u>E-Learning Models and Technologies</u> Blended learning; Digital libraries; Knowledge elicitation; Asynchronous/Synchronous learning; E-learning technology platform; Learning management systems.

3. E-Learning Course Delivery

Course components; Learning objectives; Instructional design; Internet; Human-computer interaction; Intelligent systems.

4. Project Management

Project planning and control; Roles and responsibilities; Procurement; Evaluation model and metrics; Evaluation methods.

Teaching/Learning Methodology

Face-to-face and online lectures/seminars, discussion forums, email support, and are blended to facilitate students' learning. Interactive and multimedia online learning materials are available to students for self-directed learning.

Teaching/Learning Methodologies	Intended subject learning outcomes to be assessed			
	a	b	c	d
Lecture/Seminar	✓	✓	✓	✓
Tutorial	✓		✓	✓
Case study	✓	✓	✓	✓
Discussion Forum / e-learning	✓	✓	✓	✓

Assessment Methods in Alignment with Intended Learning Outcomes

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed			
		a	b	c	d
1. Assignments	26%	✓	✓	✓	✓
2. Bulletin board	9%		✓	✓	✓
3. Case study	10%	✓	✓	✓	✓
4. Examination	55%	✓	✓	✓	✓
Total	100%				

Assignments and case study are aimed at assessing students' capabilities and understanding of e-learning technologies and practices. The bulletin board also inspires insights on applying and sustaining e-learning within the enterprise. The examination is aimed at assessing the knowledge and skills gained by the students.

Student Study Effort Expected (Block Mode / Evening Mode)	Class contact:	
	▪ Face-to-face lectures / presentations 3 hours per week x 8 weeks	24 Hrs.
	▪ On-line tutorial / seminar	3 Hrs.
	▪ Bulletin board	12 Hrs
	Other student study effort:	
	▪ Studying and self learning	36 Hrs.
	▪ Assignment, case study report writing	30 Hrs.
	Total student study effort	105 Hrs.
Reading List and References	1. Rosenberg, M, J. 2001, *E-learning: Strategies for Delivering Knowledge in the Digital Age*, Mc GrawHill 2. Carliner and Shank 2008, *The E-Learning Handbook: Past Promises, Present Challenges*, Pfeiffer 3. Piskurich, G, M. 2003, *The AMA Handbook of E-Learning: Effective Design, Implementation Technology Solutions*, American Management Association, AMACOM 4. Bonk, C, J and Graham, C, R. 2005, *Handbook of Blended Learning, Global Perspectives, Local Design*, Pfeiffer	

Subject Code	LGT5002
Subject Title	International Logistics Systems, Operations and Management
Credit Value	3
Level	5
Normal Duration	1-semester
Exclusion	CSE564 Transportation and Logistics LGT5061 International Logistics Management
Role and Purposes	This subject aims to provide students with an understanding of the growing importance of international logistics systems, operations and management. To familiarize students with the fundamental knowledge and skills of international logistics and how they can be applied to help firms achieve cost and service advantages in the world's marketplace, by integrating the logistics concept into the business and applying appropriate methods for specific logistics management problems at different international contexts.
Subject Learning Outcomes	Upon completion of the subject, students will be able to: a. Identify and evaluate the elements of an international logistics system; b. Understand the relationships between international logistics management, the international business environment, and the opportunities and challenges for Hong Kong; c. Recognize the complexity of the elements in international logistics system and how they are related to organizational performance; d. Learn the current issues for the design and evaluation of an international logistics system; e. Understand how the elements of an international logistics system should be integrated and coordinated in the most cost effective manner; f. Study the contemporary topics for logistics management in international context g. Understand ethical issues for managing international logistics systems and operations.
Subject Synopsis/ Indicative Syllabus	Concept of a logistics system; Logistics and competitiveness; Globalization and the world economy; International logistics and the opportunities and challenges for Hong Kong; International trade theories and practices; Logistics outsourcing and the risks; Logistics information management; IT-enabled logistics and emerging information technologies for logistics, Logistics customer services; Shipping markets and the roles of international shipping; Trends in the shipping industry, Air cargoes and intermodal freight transport; International purchasing and supply; Logistics and maritime security issues; Warehousing management; Reverse logistics and environmental issues; Customer and supplier relationships for international business; Trading terms and practices; Import/ export issues; Risks for international logistics operations; Quality management for logistics; Emerging topics and corporate social responsibility issues on international logistics management.
Teaching/Learning Methodology	The learning outcomes are achieved through a participative approach where students are ▪ Encouraged to think of real life examples and discuss their management

implications with peers in the class and with the lecturer;

- Required to learn from lectures, case analyses, article review, research papers, group discussion, and interactions with the lecturer and among themselves;

- Instructed to review current international logistics related articles to enhance their understanding of international logistics systems, operations, and management.

Teaching/Learning Methodologies	Intended Subject Learning Outcomes to be assessed						
	a	b	c	d	e	f	g
Lecture	✓	✓	✓	✓	✓	✓	✓
Tutorial	✓	✓	✓	✓	✓	✓	✓

Assessment Methods in Alignment with Intended Learning Outcomes

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)						
		a	b	c	d	e	f	g
1. Coursework	50 %	✓	✓	✓	✓	✓	✓	✓
2. Examination	50 %	✓	✓	✓	✓	✓	✓	✓
Total	100 %							

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

The objective of the three hours examination (50%) is for students to review all concepts covered in the course. There are four parts in coursework:

Article review presentation (10%) helps students to grasp the latest development in international logistics management and link the concepts and ideas covered in the course.

Group review report (15%) helps students organize ideas from their article review presentation after receiving comments from the lecturer and peers. This report needs to be supplemented with examples and applications in the issue being analyzed. Students are also required to propose actions to tackle the identified problems and managerial insights for international logistics management.

Individual report (20%) requires students to write an essay summarizing key points from various class activities with the aim for evaluating student learning outcomes on individual basis.

Class attendance performance (5%) encourages student participation and contributions to various class activities.

To pass this subject, students are required to obtain Grade D or above in BOTH the Continuous Assessment and Exam components.

Student Study Effort Expected	Class contact:	
	▪ Lectures / Tutorials	39 Hrs.
	Other student study effort:	
	▪ Preparation for coursework activities	42 Hrs.
	▪ Self-study for course materials	45 Hrs.
	Total student study effort	126 Hrs.
Reading List and References	***Recommended reference materials*** Lun, Y. H. V., Lai, K. H. and Cheng, T. C. E. (2010) Shipping and Logistics Management, Springer, UK. (ISBN-978-1-84882-996-1) International Journal of Shipping and Transport Logistics , Inderscience, (ISSN:-1756-6517) Journal of Shipping and Trade, Springer (ISSN:-2364-4575)	

<table>
<tr><td>Subject Code</td><td>LGT5010</td></tr>
<tr><td>Subject Title</td><td>Port Policy and Management</td></tr>
<tr><td>Credit Value</td><td>3</td></tr>
<tr><td>Level</td><td>5</td></tr>
<tr><td>Normal Duration</td><td>1-semester</td></tr>
<tr><td>Pre-requisite / Co-requisite/ Exclusion</td><td>Nil</td></tr>
<tr><td>Role and Purposes</td><td>It provides students with comprehensive knowledge on the nature of port, its evolution, development, and management. It also introduces students to the roles and functions of ports in the economic and transport infrastructure of a territory, as well as port competition and policy choices.</td></tr>
<tr><td>Subject Learning Outcomes</td><td>Upon completion of the subject, students will be able to:

a. To provide the students with comprehensive understanding on port management and operations, port competition and policy choices.
b. To provide students with the ability to analyze the implications of port policy and management.</td></tr>
<tr><td>Subject Synopsis/ Indicative Syllabus</td><td>Port development: Historical development of ports; geographical location; classification and characteristics; the economic and logistical role and functions of ports.

Port policy and regulation: Duties and powers of a port authority; port administration and structure (private vs. public sector ownership); port policies: port reform and governance; port co-operation and competition; port safety and security.

Port management: port marketing and sales; port pricing and tariffs; port investment and financing; port management information systems; future development of ports in an era of increasing ship size.

Green policy: ports and the environment: ship-borne and cargo-borne pollution; the influence of ports on the marine ecosystem.</td></tr>
<tr><td>Teaching/Learning Methodology</td><td>Lectures will be used to present the basic theories and their application to the real world. General principles of the syllabus topic will be presented and developed during the lectures. There will also be seminar-type discussions where students will develop and apply the general principles of the topic in student-centered activities, including group discussions of cases, student presentations and discussions.
<table>
<tr><td>Teaching/Learning Methodologies</td><td colspan="4">Intended Subject Learning Outcomes to be assessed</td></tr>
<tr><td></td><td>a</td><td>b</td><td></td><td></td></tr>
<tr><td>Lecture</td><td>✓</td><td>✓</td><td></td><td></td></tr>
<tr><td>Tutorial</td><td>✓</td><td>✓</td><td></td><td></td></tr>
</table>
</td></tr>
</table>

Assessment Methods in Alignment with Intended Learning Outcomes

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)					
		a	b				
1. Final Examination	50%	✓	✓				
2. Continuous Assessment	50%	✓	✓				
Total	100 %						

To pass this subject, students are required to obtain Grade D or above in BOTH the Continuous Assessment and Exam components.

Student Study Effort Expected

Class contact:	
▪ Lectures / Tutorials	39 Hrs.
Other student study effort:	
▪ Revisions	67 Hrs.
▪ Course project and presentation	20 Hrs.
Total student study effort	126 Hrs.

Reading List and References

Books:

Alderton, P. (2005): *Port Management and Operations*, 2nd edition, LLP, London.

Brooks, M.R. and Cullinane, K. (Eds.) (2007): *Devolution, Port Governance and Port Performance*, Elsevier, London.

Cullinane, K. and Talley, W.K. (Eds.) (2006): *Port Economics*, Elsevier, London.

Frankel, E.G. (1987): *Port Planning and Development*, John Wiley & Sons, New York.

Song, D.W. and Cullinane, K. (Eds.) (2007): *Asian Container Ports*, Palgrave Macmillan, New York.

Talley, W.K. (Ed.) (2008): *Maritime Safety, Security and Piracy*, LLP, London.

Wang, J., Olivier, D., Notteboom, T. and Slack, B. (Eds.) (2007): *Ports, Cities, and Global Supply Chains*, Ashgate, Aldershot.

Journals :

Environment and Planning A
Journal of Transport Geography
Maritime Economics and Logistics (formerly International Journal of Maritime Economics)
Maritime Policy and Management
Research in Transportation Economics

Subject Code	LGT5013
Subject Title	Transport Logistics in China
Credit Value	3
Level	5
Normal Duration	1-semester
Pre-requisite	Students are expected to understand Putonghua and to read simplified Chinese Characters.
Role and Purposes	To provide within an operational and business environment: an advanced understanding of the market demand and supply, as well as principles and complexities of different mode of transportation in freight industry in China; the advanced skills necessary to implement logistics and supply chain management strategy in various industrial sector within a logistics company environment; proactive thinking to achieve and sustain advantage in a rapidly changing business/freight operational environment in China.
Subject Learning Outcomes	Upon completion of the subject, students will be able to: a. Analyse macro economical and industrial situation of transport logistics in China with updated facts and numbers. b. Describe the modes of logistics operation of road, water, air, and rail in China. c. Gain strategic insight on how to develop logistics related business within China, with deep-dive analysis into rapid developing sectors. d. Examine the policy and regulations in domestics and international trade and logistics and the logistics relationship between China and Hong Kong. e. Apply the Chinese transport and customs law. f. Develop the ability to assess and evaluate the different logistics environments in China and Hong Kong.
Subject Synopsis/ Indicative Syllabus	▪ Organisational and Principal Characteristics of Transport Logistics in China: Logistics operation of Air Transport; Logistics operation of Sea/ Inland waterway Transport; Logistics operation of Rail Transport; Logistics operation of Road Transport; and Port Operations. ▪ Transport Economics. Demand and supply for freight transportation services, market structure and organization, government intervention, as well as strategic infrastructure investment in different Chinese transport sectors (port, air, rail, road, and sea/inland waterway).

- Overview of China Trade and its impact on logistics; Chinese Contract Law; Commercial Transport Policy; Human Resource Management in China; Trading practice and related government organisations in China; Hong Kong/China co-operation; Future developments in China Trade.

- Customs ordinances and trade regulations; Legal framework for transport and logistics in China; Foreign investment law in transport and logistics industries; Chinese judicial system for maritime and logistics cases, Chinese Maritime Law (covering bills of lading, voyage and time charter parties; marine insurance;); and Build and Finance Ships in China.

Teaching/Learning Methodology

Lectures introduce and explain key concepts and key sectors with case analysis. Lectures are followed by class discussions where concepts are linked to real events in the industry through appropriate examples and their analysis.

Seminars are highly interactive and include discussions of current / past events, case studies, and student presentations. Students are expected to actively participate in the classes and to share their experience and learn from each other.

Teaching/Learning Methodologies	Intended Subject Learning Outcomes to be assessed					
	a	b	c	d	e	f
Lecture	✓	✓	✓	✓	✓	✓
Tutorial	✓	✓	✓	✓	✓	✓

Assessment Methods in Alignment with Intended Learning Outcomes

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)					
		a	b	c	d	e	f
1.Coursework Assignment/ case analysis	50%	✓	✓	✓	✓	✓	✓
2. Examination	50%	✓	✓	✓	✓	✓	✓
Total	100 %						

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

- Since the course focuses on transport logistics in China, case analysis and learning from practical, work-based experiences forms an important constituent of student assessment. Further, assignments and case analysis reinforce theoretical concepts learnt during the lectures and enable their applications in real-life operational situations. Final examination that assesses student's familiarity with theoretical concepts and the ability to apply conceptual framework in case analysis.

- Students would be given regular feedback on their performance, by email or as comments on assignments submitted.

	To pass this subject, students are required to obtain Grade D or above in BOTH the Continuous Assessment and Exam components.	
Student Study Effort Expected	Class contact:	
	▪ Lectures / Tutorials	39 Hrs.
	Other student study effort:	
	▪ Self study	45 Hrs.
	▪ Coursework	42 Hrs.
	Total student study effort	126 Hrs.
Reading List and References	Charles Guowen Wang, *CSCMP Global Logistics Perspective – China*, 2005, 2015 Binglian Liu, ect, *Contempery Logistics in China*, 2012, 2013 Blauwens,Gust; Peter De Baere, Eddy van de Voorde (2006), *Transport economics Antwerpen* : De Boeck. *China freight transport report* [electronic resource] / Business Monitor International London : Business Monitor International. Anming Zhang et al. (2004), *Air cargo in mainland China and Hong Kong* / Anming Zhang ... [et al.]. Aldershot, England : Ashgate, c2004. .Hirst, Mike., (2008), *The air transport system,* Cambridge, England : Woodhead Pub. *Ports, cities, and global supply chains*, Edited by James Wang et al., Aldershot, England: Ashgate, 2007. 《中国物流学术前沿报告》 / 中国物流与采购联合会, 北京市 : 中国物资出版社, 2014,2015,2016 《中國海關 》 [electronic resource] 北京 : 中國學術期刊(光盤版)電子雜誌社 《海关报关实务 》[electronic resource], 谢国娥编著. 上海 : 华东理工大学出版社, 2004. 《中国海关监管与征 》[electronic resource] / 朱新瑞主编. 中国 : 中国海洋大学出版社, 2003. 《中国现代物流发展报告》，南开大学/国家发改委, 2014,2015,2016 《中国物流年鉴》，中国物资出版社，2009，2011，2012，2013，2014,2015,2016 《中国供应链管理蓝皮书》，/丁俊发主编，中国：中国物资出版社，2011-2014, 2015, 2016	

Subject Code	LGT5017
Subject Title	Maritime Logistics
Credit Value	3
Level	5
Normal Duration	1-semester
Pre-requisite / Co-requisite/ Exclusion	Nil
Role and Purposes	The aim of this unit is to provide students with a full understanding of current developments in maritime transport logistics, and to enable them to identify and solve problems related to maritime transport logistics in the context of international shipping.
Subject Learning Outcomes	Upon completion of the subject, students will be able to: a. Demonstrate relevant professional knowledge and understanding of maritime logistics, the international maritime environment in which they operate and how they are managed. b. Understand and respond to current developments of the relevant political, economical, social and technological issues and their influences on the operations and management of maritime logistics. c. Analyse and integrate the inter-relationships among the various components of subject matters in shipping logistics for effective problem solving.
Subject Synopsis/ Indicative Syllabus	International seaborne trade. Maritime transportation and cargoes. Dry bulk and liquid bulk commodity logistics and services. Maritime transport terminals design and operations. Port and carrier selection. Third party shipping management. Materials handling and packaging for maritime transport. Environmental issues and international regulations on environmental protection in maritime logistics. Regulating regimes in international shipping. Issues in liner shipping. Transhipment hub, logistical networks and feeder concepts. Logistics of empty containers. Management of multimodal transport. Technologies in maritime logistics. Logistics center and free trade zone. Maritime security issues and technology.
Teaching/Learning Methodology	Lectures introduce and explain key theoretical risk-related concepts. Lectures are followed by class discussions where concepts are linked to real events in the industry through appropriate examples and their analysis. Seminars are highly interactive and include discussions of current / past events, case studies, and student presentations. Students are expected to actively participate in the classes and to share their experience and learn from each other.

Assessment Methods in Alignment with Intended Learning Outcomes

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)					
		a	b	c			
Coursework							
Presentation / quiz	30%	✓	✓	✓			
Participation in discussions / Attendance	20%	✓	✓	✓			
Examination	50%	✓	✓	✓			
Total	100 %						

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

Since the course focuses on the maritime logistics, case analysis and learning from practical, work-based experiences form an important constituent of student assessment. Coursework in the form of presentation and quiz which targets some critical issues in the management of maritime logistics in context will reinforce theoretical concepts learnt during the lectures and enable their applications in real-life operational situations, as well as enhance students' communications skills and reinforce their concepts through two-way dialogue and discussions.

Students would be given regular feedback on their performance, by email or as comments on assignments submitted.

To pass this subject, students are required to obtain Grade D or above in BOTH the Continuous Assessment and Exam components.

Subject Code	LGT5164
Subject Title	Aviation Safety Management
Credit Value	3
Level	5
Normal Duration	1-semester
Pre-requisite	Nil
Role and Purposes	To provide the student with an understanding of the key issues in aviation safety management, the implementation of Safety Management Systems, and how safety is managed in airlines, airports and aviation-related companies.
Subject Learning Outcomes	Upon completion of the subject, students will be able to: a. Describe the fundamental concepts behind Safety Management Systems (SMS), as defined by ICAO and other parties. b. Select and implement techniques for the identification and management of hazards and risks. c. Understand key issues in the implementation of Safety Management Systems d. Critically assess the ways in which safety is measured and managed in airport, airline and other aviation operations.
Subject Synopsis/ Indicative Syllabus	• Safety management philosophy and implementation • Safety supervision in civil aviation • Principles of quality management • Hazard identification • Process-based safety risk management • Crisis management • Emergency response planning • Safety culture • Human factors • Managing the Safety Management Systems • Implementing an Safety Management Systems
Teaching/Learning Methodology	A combination of lectures, seminars, case studies, group workshops and students-directed learning activities will be included in this subject.

Assessment Methods in Alignment with Intended Learning Outcomes

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)					
		a	b	c	d		
Coursework	50%	✓	✓	✓	✓		
Examination	50%	✓	✓	✓	✓		
Total	100 %						

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

To pass this subject, students are required to obtain Grade D or above in BOTH the Continuous Assessment and Exam components.

Student Study Effort Expected

Class contact:	
▪ Lectures / Tutorials	39 Hrs.
Other student study effort:	
▪ Self study	87 Hrs.
Total student study effort	126 Hrs.

Reading List and References

Books

- Ferguson, M. and Nelson, S. (2013) *Aviation Safety: A Balanced Industry Approach*, Cengage Learning.
- ICAO (2009) *Safety Management Manual* (2nd Edition), Doc. 9859, Montreal – Downloadable from http://www.icao.int/anb/safetymanagement/documents.html.
- Rodingues, C. and Cusick. S. (2011). *Commercial Aviation Safety*, 5th Edition, McGraw-Hill Professional.
- Stolzer, A.J., Halford, C.D. and Goglia, J.J. (2008) *Safety Management Systems in Aviation*, Ashgate, Aldershot UK.
- Stolzer, A.J., Halford, C.D. and Goglia, J.J. (2013), *Implementing Safety Management Systems in Aviation*, Ashgate, Aldershot UK.