Syllabus form

The Hong Kong Polytechnic University

Subject Description Form

Subject Code	LGT6508
Subject Title	Digital Logistics Engineering
Credit Value	3
Level	6
Normal Duration	1 semester
Pre-requisite / Co-requisite/ Exclusion	Nil
Objectives	This subject contributes to the following Intended Learning Outcomes for the doctoral programme: Doctor of International Shipping and Port (D.ISP). #2Understand and tackle International Shipping and Port Management issues by using relevant principles and emerging technologies Digital logistics engineering is a rapidly evolving field that has its roots in traditional logistics, a military term that is referred to the organised movement of goods, services, information, and people from their point of origin to the point of consumption. The aim of this subject is to introduce students to the field of digital logistics engineering and distribution management and provide them with a comprehensive understanding of how businesses can leverage technology to manage logistics efficiently, with a special focus on the maritime industry. Real business case studies are incorporated to illustrate practical applications of digital logistics engineering concepts. This subject covers a range of topics, including digital technologies used in logistics, optimisation of logistics processes through digital tools and data analytics, data-driven decision-making, implementation of digital supply chain solutions, addressing emerging challenges in the digital logistics landscape, and fostering critical thinking and problem-solving skills. By getting trained in this subject, students will be well-equipped to excel in careers related to logistics, supply chain management, and technology-driven industries.

Intended Learning Outcomes	Upon completion of the subject, students will be able to: a. demonstrate proficiency in understanding and applying digital technologies to optimise logistics operations, particularly in the maritime industry. b. analyze modern maritime logistics management strategies and their significance and applications in the maritime domain, with the aim to improve efficiency. c. utilise digital tools and data analytics to enhance logistics processes, and make data-driven decisions that can improve supply chain performance. d. tackle emerging challenges in the digital logistics landscape, such as the use of blockchain, IoT, and autonomous vessels. e. develop critical thinking and problem-solving skills in logistics contexts, including the ability to identify, formulate and solve logistics and distribution problems. f. demonstrate effective communication skills including teamwork, presentation and project management in logistics-related contexts.
Subject Synopsis/ Indicative Syllabus	**Introduction to Digital Logistics Engineering:** Provide an overview of digital logistics engineering and its significance in the modern logistics landscape. Students will explore the evolution of logistics in the digital age and the technological advancements shaping digital logistics. **Digital Tools and Systems in Logistics:** Focus on digital logistics platform, software, and systems, and how they integrate to facilitate effective logistics management and the digitization of supply chains. Students will gain knowledge of various digital tools and systems used in logistics operations. **Data Analytics for Logistics Optimization:** Cover data analytics techniques used in making informed logistics decisions. Students will learn techniques for collecting, analysing, and interpreting logistics data, including predictive analytics and demand forecasting. **Warehouse Optimisation and Inventory Management:** Focus on digital approaches to optimise warehouse layouts and effectively manage inventory. Students will explore demand-driven and lean inventory strategies, warehouse management systems, and smart inventory management techniques. **Maritime Logistics Management:** Focus on the management aspects of maritime logistics operations. Explore port logistics, vessel scheduling, cargo stowage planning, and the coordination of activities within the maritime supply chain. **Risk Management in Maritime Logistics:**

Cover identifying and mitigating risks, specific to maritime logistics and supply chain management. Students will gain an understanding of risk assessment and management strategies.

Sustainable Practices in Digital Logistics:
Focus on incorporating sustainability principles in digital logistics. Examine environmental impact assessment, carbon footprint reduction, and the implementation of reverse logistics, green packaging, and circular economy concepts.

Emerging Technologies in Digital Logistics:
Explore emerging technologies transforming digital logistics, including artificial intelligence (AI), machine learning, blockchain applications, and augmented reality (AR) and virtual reality (VR) in logistics operations. Understand their potential impact on supply chain management.

Teaching/Learning Methodology	Lectures serve as a platform for discussing the fundamental theories in the subject. Tutorials involve engaging in case studies and small group discussions. To facilitate practical application of the acquired knowledge, a term project is designed, focusing on analyzsing logistics management issues within local industries. This project enables students to apply the concepts learned in class to real-world case situations, fostering critical thinking and problem-solving skills.

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
Continuous Assessment	50 %						
Individual Assignment	25 %	√	√	√	√	√	
Group Project	25 %			√	√	√	√
Final Examination	50 %	√	√	√	√	√	√
Total	100 %						

To reflect the significant technology content in this subject, 10% (or more) of the overall weighting of this subject is based on individual assessment concerning technology-related knowledge.

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

The continuous assessment and final examination assess the students' understanding of the concepts of digital logistics engineering. The continuous assessment requires students to integrate knowledge and skills in logistics operations across a wide range of business domains and levels especially for maritime industry. The examinations also require students to think critically and

creatively to solve digital logistics problems.

Student Study Effort Expected	Class contact:	30 Hrs.
	▪ Lectures	20 Hrs.
	▪ Tutorial/Seminar	10 Hrs.
	Other student study effort:	96 Hrs.
	▪ Project Preparation	51 Hrs.
	▪ Exam Preparation	45 Hrs.
	Total student study effort	126 Hrs.
Reading List and References	**Recommended Textbook** Bowersox, D.J., Closs, D.J. and Cooper, M.B. (2020), Supply Chain Logistics Management (5th edition). McGraw Hill. **References:** Paksoy, T., Kochan, C. G., & Ali, S. S. (Eds.). (2020). *Logistics 4.0: Digital transformation of supply chain management*. CRC Press. Wang, Y., & Pettit, S. (Eds.). (2016). *E-Logistics: Managing your digital supply chains for competitive advantage*. Kogan Page Publishers. Christopher, M. (2016). *Logistics & supply chain management*. Pearson Uk. Paksoy, T., Kochan, C. G., & Ali, S. S. (Eds.). (2020). Logistics 4.0: Digital transformation of supply chain management. CRC Press. Khang, A., Abdullayev, V., Hahanov, V., & Shah, V. (Eds.). (2024). Advanced IoT Technologies and Applications in the Industry 4.0 Digital Economy. CRC Press.