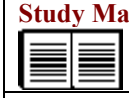
Logistics & Supply Chain (850)

Unit: Production Management **Exam Paper No.:** 5	**Guided Learning Hours:** 220
Prerequisites: Basic knowledge of business procedures.	**Corequisites:** A Pass or better in Certificate in Business Studies or equivalence.
Aim: The essence of a manufacturing business is to provide goods and services to customers that are reasonable price and of good quality. However, if production process is not optimised, the entire supply chain process fails. Production is a process of transforming raw materials into a desired product by adding value. Purpose of the course is to give an overview of operations/manufacturing systems, how to measure system performance and assess/analyse characteristics that affect the flow within the production process. Production or supply chain does not run like clockwork; hence the importance of understanding supply chain random events such as the impact of variability, randomness (probability) and uncertainty (risks) is core. Learners learn causes of variability and randomness; at the same time; how to plan responses that mitigate risks; manage and implement risk responses by performing both qualitative and quantitative risks analysis. This includes how to reduce the probability of errors or defects using Six Sigma quality improvement methodology; its origins and implementation of DMAIC (Define, Measure, Analyse, Improve, Control) model. Learners are given a case study in order to understand the product development scenarios in managing quality, demand, waste, delay and resource utilisation. On completion of the course, students will be able to conduct a six sigma project; implementing DMAIC improvement cycle process and perform defect calculations.	
Required Materials: Recommended Learning Resources.	**Supplementary Materials:** Lecture notes and tutor extra reading recommendations.
Special Requirements: None	

Intended Learning Outcomes:	**Assessment Criteria:**
1. Understand the overview of manufacturing systems; what they entail and problems faced within manufacturing/supply chain during product development.	1.1 Explore product development scenarios. 1.2 Describe constraints in maintaining quality at the same time meeting demand, making profit and ensuring stability and safety. 1.3 Evaluate issues caused by machine break downs or repair/maintenance issues. 1.4 Demonstrate how increased demand and be accomplished without incurring extra costs. 1.5 Identify product manufacturing/development complexities. 1.6 Describe system performance measurements. 1.7 Explain how product development / manufacturing operations can minimise waste (both in terms of time delays and materials), idle workforce and utilisation.
2. Understand variability, randomness (probability) and uncertainty (risks) in operations/manufacturing product development. The importance of probability in business, causes and how management can increase probability of opportunities while decreasing probability of threats.	2.1 Demonstrate differences between variability, probability and uncertainty; and causes of each. 2.2 Be able to identify and manage risk in a given scenario. 2.3 Be able to develop risk register and calculate risk Expected Monetary Value (EMV). 2.4 Be able to perform qualitative and quantitative risks analysis. 2.5 Develop decision trees to assess different options. 2.6 Describe risk response and contingency plans. 2.7 Be able to evaluate strategies for responding to threats and opportunities.
3. Understand six sigma methodology; its meaning and origins. Understand the techniques in	3.1 Define six sigma.

improving product development by reducing errors and defects probability; thereby increasing both quality and efficiency/effectiveness of business processes.	3.2 Explore each step of the six sigma methodology. 3.3 Demonstrate different DMAIC tools. 3.4 Analyse the DMAIC step cycle and assess how the sum of the steps results are greater than the different parts. 3.5 Identify personnel involved in implementing each DMAIC step. 3.6 Describe why DMAIC is important in product development. 3.7 Describe different tools used DMAIC phases.
4. Understand the DMAIC process six sigma roadmap and the problem solving strategies are implemented in a six sigma project.	4.1 Be able to develop a six sigma product development project. 4.2 Describe the define stage by brainstorming customer expectations; to select potential Critical-To-Quality (CTQ) parameter(s). 4.3 Identify how to measure the critical to quality parameter. 4.4 Identify variabilities, probabilities and risks to make improvement plans. 4.5 Be able to produce control plans and response plans to mitigate future risks.
5. Understand the defect impacts, meaning of defect per unit (DPU), defect per million opportunities (DPMO) and be able to measure and calculate both process yields and parts per million.	5.1 Evaluate impact of defects and be able to measure defect levels. 5.2 Demonstrate how to calculate both process yields and parts per million. 5.3 Differentiate defect and defective parts. 5.4 Evaluate Defect Per Uni (DPU) versus Defect Per Million Opportunities (DPMO). 5.5 Explain how to prevent defects.
Methods of Evaluation: A 2½-hour essay written examination paper with 5 questions, each carrying 20 marks. Candidates are required to answer all questions. Candidates also undertake project/coursework Production Management with a weighting of 100%.	

Recommended Learning Resources: Production Management

Text Books	• Production Management by Peter Dean. ISBN-13 : 978-1861264510 • Operations Management by Nigel Slack. ISBN-13 : 978-1292253961 • The Good Production Planner by Martin Hendel. ISBN-13 : 979-8820061301
Study Manuals 	BCE produced study packs
CD ROM 	Power-point slides
Software 	None