Part-Time Diploma in Engineering (Operations and Engineering Management)

COURSE SYNOPSIS
The Part-Time Diploma in Engineering (Operations and Engineering Management) provides participants the opportunity to be trained in logistics and operations management, as well as quality and productivity improvement. Equipped with the knowledge, working professionals will be able to help companies improve productivity and business efficiency, and at the same time move up the career ladder to a junior management role.

TARGET AUDIENCE
Working adults who wish to upgrade themselves by learning the various engineering management tools and methodologies.

ENTRY REQUIREMENTS
Applicants should possess the one of the following combinations of qualification and work experience:

• 3 GCE ‘O’ Levels passes in relevant subjects with at least 3 years of relevant work experience;
• NITEC (GPA 3.5 and above) with at least 2 years of relevant work experience;
• Higher NITEC with at least 1 year of relevant work experience;
• Relevant WSQ Diploma with at least 3 years of relevant work experience.

Fees Payable (inclusive of GST and subsidy)

<table>
<thead>
<tr>
<th>Category</th>
<th>Modular Certificate Fee</th>
<th>Total Course Fee</th>
</tr>
</thead>
<tbody>
<tr>
<td>Singapore Citizen (WTS scheme)*</td>
<td>$ 169.38</td>
<td>$ 846.90</td>
</tr>
<tr>
<td>Singapore Citizen (40 years &amp; above)</td>
<td>$ 288.90</td>
<td>$ 1,444.50</td>
</tr>
<tr>
<td>Singapore Citizen (SME-sponsored)*</td>
<td>$ 309.78</td>
<td>$ 1,548.90</td>
</tr>
<tr>
<td>Singapore Citizen (below 40 years old)</td>
<td>$ 442.98</td>
<td>$ 2,214.90</td>
</tr>
<tr>
<td>Singapore Permanent Resident</td>
<td>$ 1,194.12</td>
<td>$ 5,970.60</td>
</tr>
<tr>
<td>Others</td>
<td>$ 3,004.56</td>
<td>$15,022.80</td>
</tr>
</tbody>
</table>

Course Commencement Date: April/October Intakes
Course Duration: 900 hours, 2.5 years
Course Venue: Republic Polytechnic Campus

* WTS refers to Workfare Training Support Scheme.
* Singapore Citizens (40 years and above) fees apply for those 40 years and above.
Course fees accurate as of 1 July 2016, subjected to review yearly.
Working adults who wish to upgrade themselves by improving productivity and business efficiency, and at the same time, professionals will be able to help companies improve their ability to be trained in logistics and operations engineering management (L&OEM) provides participants the knowledge and skills required to operate in a global and competitive environment.

COURSE SYNOPSIS

- **Human factors engineering**: Participants will learn how to improve work productivity of human operators. This module imparts a fundamental understanding of human factors, work measurement and work study. Participants will learn how to plan facility layout to facilitate material flow, improve production schedule and reduce work content of a job with the aim of improving productivity. Work measurement methods such as time study, activity sampling methods, and methods analysis will be taught. Measurements of productivity and methods to improve productivity will be taught.

- **Statistical Methods in Quality**: This module focuses on the analyses of data, as well as the applications of statistics in quality studies. Topics include estimates of mean and variance, sampling distributions, hypotheses testing, confidence intervals, variance tests and factorial experiments.

- **Quality Control**: This module focuses on the use of statistical methods for quality control and improvement. The module covers basic quality control tools and techniques including Statistical Process Control, Process Capability Analysis, Measurement System Analysis, Design of Experiments and Acceptance Sampling.

- **Lean Six Sigma Methods**: This module provides an introduction to the fundamental concepts of lean manufacturing and six sigma. It will cover the understanding of lean manufacturing in the area of waste elimination, value stream management and the tools and methods for improving process flow. It will also introduce the six sigma DMAIC processes.

- **Productivity and Work Study**: This module covers methods to measure and analyze work content of a job with the aim of improving productivity. Work measurement methods such as time study, activity sampling methods, and methods analysis will be introduced. Measurements of productivity and methods to improve productivity will be taught.

- **Global Logistics Management**: The Certificate aims to train participants in statistical methods and tools to carry out quality improvement activities. Participants will also gain broad knowledge in quality management and be trained in quality engineering methods. It is relevant to manufacturing, service and logistics companies that want to implement the appropriate quality systems or embark on quality improvement initiatives.

- **Statistical Process Control, Process Capability Analysis, Measurement System Analysis, Design of Experiments and Acceptance Sampling**

- **Decision and Cost Analysis**: This module focuses on the use of statistical methods for quality control and improvement. The module covers basic quality control tools and techniques including Statistical Process Control, Process Capability Analysis, Measurement System Analysis, Design of Experiments and Acceptance Sampling.

- **Project Management**: This module provides an understanding of the concept of project management. Topics include project planning, project scheduling, cost estimation and budgeting, resource allocation, monitoring and control, and risk measurement and analysis. Topics on decision making under risk and uncertainty, decision making under uncertainty, and decision making under competitive environments will be covered.

- **Facilities Planning and Design**: This module provides an introduction to the fundamental concepts of facilities planning and design. Participants will learn how to plan facility layout to facilitate material flow, improve production schedule and reduce work content of a job with the aim of improving productivity.

- **Operations Research and Simulation**: This module provides an introduction to the fundamental concepts of operations research and simulation. Participants will learn how to plan facility layout to facilitate material flow, improve production schedule and reduce work content of a job with the aim of improving productivity. The module covers the understanding of the basic concepts of operations research, simulation and decision analysis. Statistical analysis and simulation models will be taught to solve complex problems.

- **Warehousing and Distribution**: This module provides an introduction to the fundamental concepts of warehousing and distribution. Participants will learn how to plan facility layout to facilitate material flow, improve production schedule and reduce work content of a job with the aim of improving productivity. The module covers the understanding of the basic concepts of warehousing and distribution, and the tools and methods for improving process flow. It will also introduce the six sigma DMAIC processes.

- **Inventory Management**: This module provides an introduction to the fundamental concepts of inventory management. Participants will learn how to plan facility layout to facilitate material flow, improve production schedule and reduce work content of a job with the aim of improving productivity. The module covers the understanding of the basic concepts of inventory management, and the tools and methods for improving process flow. It will also introduce the six sigma DMAIC processes.

- **Engineering Systems Management**: This module provides an introduction to the fundamental concepts of engineering systems management. Participants will learn how to plan facility layout to facilitate material flow, improve production schedule and reduce work content of a job with the aim of improving productivity. The module covers the understanding of the basic concepts of engineering systems management, and the tools and methods for improving process flow. It will also introduce the six sigma DMAIC processes.

- **Decision and Cost Analysis**: This module focuses on the use of statistical methods for quality control and improvement. The module covers basic quality control tools and techniques including Statistical Process Control, Process Capability Analysis, Measurement System Analysis, Design of Experiments and Acceptance Sampling.

- **Green Manufacturing and Planning**: This module provides an introduction to the fundamental concepts of green manufacturing and planning. Participants will learn how to plan facility layout to facilitate material flow, improve production schedule and reduce work content of a job with the aim of improving productivity. The module covers the understanding of the basic concepts of green manufacturing and planning, and the tools and methods for improving process flow. It will also introduce the six sigma DMAIC processes.

- **Life Cycle Management**: This module provides an introduction to the fundamental concepts of life cycle management. Participants will learn how to plan facility layout to facilitate material flow, improve production schedule and reduce work content of a job with the aim of improving productivity. The module covers the understanding of the basic concepts of life cycle management, and the tools and methods for improving process flow. It will also introduce the six sigma DMAIC processes.

- **Facilities Planning and Design**: This module provides an introduction to the fundamental concepts of facilities planning and design. Participants will learn how to plan facility layout to facilitate material flow, improve production schedule and reduce work content of a job with the aim of improving productivity. The module covers the understanding of the basic concepts of facilities planning and design, and the tools and methods for improving process flow. It will also introduce the six sigma DMAIC processes.

- **Operations Research and Simulation**: This module provides an introduction to the fundamental concepts of operations research and simulation. Participants will learn how to plan facility layout to facilitate material flow, improve production schedule and reduce work content of a job with the aim of improving productivity. The module covers the understanding of the basic concepts of operations research and simulation, and the tools and methods for improving process flow. It will also introduce the six sigma DMAIC processes.

- **Inventory Management**: This module provides an introduction to the fundamental concepts of inventory management. Participants will learn how to plan facility layout to facilitate material flow, improve production schedule and reduce work content of a job with the aim of improving productivity. The module covers the understanding of the basic concepts of inventory management, and the tools and methods for improving process flow. It will also introduce the six sigma DMAIC processes.

- **Engineering Systems Management**: This module provides an introduction to the fundamental concepts of engineering systems management. Participants will learn how to plan facility layout to facilitate material flow, improve production schedule and reduce work content of a job with the aim of improving productivity. The module covers the understanding of the basic concepts of engineering systems management, and the tools and methods for improving process flow. It will also introduce the six sigma DMAIC processes.
• Quality Management
This module covers productivity and quality management-related issues such as the development of Quality Systems, TQM, PDCA, Quality Circles, Singapore Quality Awards, 5S Housekeeping and the ISO9000 Quality Management System.

3. Certificate in Logistics Management
The Certificate will impart participants with basic knowledge in logistics management. Participants will gain in-depth understanding of critical logistics functionalities such as warehousing, inventory management and distribution. Global logistics issues will also be covered. This Certificate is relevant to 3rd party logistics companies and any organization that deals with inventories.

• Warehousing and Distribution
This module imparts a fundamental understanding of warehousing and distribution management in industry today. Topics include storage and retrieval systems, labour and equipment requirements, planning of distribution centres, security and safety in distribution, vehicle selection as well as import and export procedures.

• Inventory Management
This module covers principles and practical knowledge required to plan and control inventories of goods and materials. Topics include the role and importance of carrying inventories, inventory classifications, planning and control, and a study of the costs of inventory.

• Global Logistics Management
This module covers the principles of efficient and effective management of logistics in international business. It examines different aspects of logistics including purchasing and reverse logistics as well as global logistics trends and security challenges. Optimization models for logistics decision making and supply chain design will also be introduced.

4. Certificate in Manufacturing Planning and Optimisation
The Certificate aims to train students to perform manufacturing planning and control effectively. Participants will learn how to plan facility layout to facilitate material flow, improve production schedule and perform production functions such as forecasting and planning for optimal product mix. Sustainable manufacturing methods will also be introduced. This Certificate is relevant to industries such as aerospace engineering, semi-conductor manufacturing and precision engineering.

• Operations Research and Simulation
This module introduces fundamental concepts of operations research, such as linear programming, network analysis, queuing theory, forecasting and time series analysis, inventory control, and replacement to solve production planning and engineering management problems. The use of simulation will be taught to solve complex problems.

• Green Manufacturing and Planning
This module provides an understanding of the concept of capacity planning and production planning. Topics include master production scheduling, materials requirement planning, capacity planning and production activity control. Calculation of carbon footprint as well as sustainable practices in manufacturing will be introduced.

• Facilities Planning and Design
This module covers the key concepts of facility planning and design which facilitate synchronous material flow, reduce material handling and movement, and maximize use of floor space. The requirements of plant site location selection, plant and office layouts, basic facility services, as well as the selection of machines and labour will also be covered.

5. Certificate in Engineering Systems Management
The Certificate aims to equip students with the skills to plan and manage the development, operations and support of engineering systems. Participants will learn how to predict system performance and perform trade-off analysis to select design and operating characteristics that meet users’ requirements cost-effectively. This Certificate is relevant to industries such as aerospace engineering, clean energy and medical technology and engineering services.

• Decision and Cost Analysis
This module introduces the basics of decision and cost analysis. Topics on decision making under risk and uncertainty and tools like decision trees, trade-off analysis and utility functions will be taught. This module also introduces various approaches towards the selection of equipment and materials for cost-effective operations as well as performing analyses of system costs over the life cycles of products and services.

• Project Management
This module covers basic concepts in project management. Topics include project planning, project scheduling, cost estimation and budgeting, resource allocation, monitoring and control, and risk measurement and management.
• Life Cycle Management

This module covers the process of managing system life cycle from the acquisition/development to operations and support. Methodologies and decision processes for arriving at cost-effective system solutions will be covered. Topics include needs analysis, quality function deployment, reliability engineering, maintainability engineering, logistics and supportability engineering.