**ADVANCED DIPLOMA OF**
**MECHANICAL ENGINEERING TECHNOLOGY**

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| **MODULE DETAILS** | **Module 10: Process Plant Layout and Piping Design**<br><br>Nominal duration: 3 weeks (36 hours total time commitment)<br><br>This time commitment includes the preparation reading, attendance at each webinar (1 hour plus 15-30 minutes for discussion), and the time necessary to complete the assignments and further study. |
| **MODULE PURPOSE** | Process plants such as refineries and petrochemical plants are complex facilities consisting of equipment, piping systems, instruments, electrical systems, electronics, computers, and control systems. The design, engineering and construction of process plants involve multidisciplinary team effort. Plant layout and design of piping systems constitute a major part of the design and engineering effort. The objective is to design safe and dependable processing facilities in a cost effective manner. The fact is that there are few formal training programs with a focus on plant layout and design of piping systems, therefore most of the required skills are acquired while on the job, reducing productivity and efficiency.<br><br>This interactive module will cover the fundamental principles and concepts used in process plant layout and piping design. You will have an opportunity to learn and discuss the techniques and procedures used in the design and engineering of complex process plants, including fundamentals of plant layout, the equipment used, design principles and procedures. Practical examples from actual projects will be used extensively to illustrate the principles and drive home the point. |
| **PRE-REQUISITE MODULES/UNIT(S)** | NONE |
| **ASSESSMENT STRATEGY** | To evaluate the achievement of the learning outcomes; written assignments, group projects and practical exercises are set. |
| **SUMMARY OF LEARNING OUTCOMES** | 1. Examine and discuss the basics of process plant layout and design<br>2. Describe the basic attributes of equipment used in process plants<br>3. Examine and discuss the basics of plant layout and plot plans<br>4. Examine and discuss the basics of Process and Instrumentation Diagrams<br>5. Create plant layout and piping design documentation |

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| **Learning Outcome 1** | **Examine and discuss the basics of process plant layout and design** | |
| **Assessment criteria** | 1.1 | Examine and discuss plant layout fundamentals |
| | 1.2 | Outline the basics of procedures and workflow methods |
| | 1.3 | Interpret Process Flow Diagrams (PFDs) |
| **Learning Outcome 2** | **Describe the basic attributes of equipment used in process plants** | |
| **Assessment criteria** | 2.1 | Discuss the functions of process and mechanical equipment used in process plants |
| | 2.2 | Interpret equipment drawings and specifications |
| | 2.3 | Describe the nature of equipment foundations and supports |
| **Learning Outcome 3** | **Examine and discuss the basics of plant layout and plot plans** | |
| **Assessment criteria** | 3.1 | Interpret plant layout specifications |
| | 3.2 | Discuss guidelines and codes for plant layout |
| | 3.3 | Interpret plot plans and equipment arrangement drawings |
| | 3.4 | Examine and discuss plant safety issues |
| **Learning Outcome 4** | **Examine and discuss the basics of Process and Instrumentation Diagrams** | |
| **Assessment criteria** | 4.1 | Interpret Process and Instrumentation Diagrams (P&ID) |
| | 4.2 | Describe the use of P&IDs in plant layout and piping design |
| | 4.3 | Recognize instruments and instrument symbols |
| | 4.4 | Describe the layout and components of meter runs |

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| **Learning Outcome 5** | **Create plant layout and piping design documentation** | |
| **Assessment criteria** | 5.1 | Interpret piping specifications and codes |
| | 5.2 | Create plant layout and piping design (a) lists, (b) drawings and (c) models |

**Delivery Mode**
A combination of asynchronous and synchronous e-learning delivery comprising a judicious mix of interactive online web conferencing, simulation (virtual labs) software, remote online labs, online videos, PowerPoint slides, notes, reading and study materials (in PDF, HTML and Word format) accessed through the Moodle Learning Management System (LMS).