

## NITEC IN TECHNOLOGY – CHEMICAL PROCESS TECHNOLOGY

Course Code: NTCPZ / Plan Code: NTCPZ

### COURSE OBJECTIVE

The bio-pharmaceutical and chemical industries in Singapore are fast growing, fuelled by international investment locally and driven by increased demand internationally. The energy and chemical process industry in Singapore is one of the world's leading hubs through a powerful mix of capabilities in safety, manufacturing and innovation. Singapore remains one of the top choices in the heart of Asia for major biotechnology and pharmaceutical giants, as they capitalise on the nation's proximity in Asia, strong innovation ecosystem and regulatory standards.

Join us if you aspire to gain the skills set that can be applied to these sectors.

The Chemical Process Technology course offers students a broad background in skills and knowledge for the bio-pharmaceutical and chemical industries. The course combines sciences with engineering concepts.

You can choose one of the following two options to further develop your interest:

- a. Bio-pharmaceuticals
- b. Petrochemicals

All options can lead you for a full spectrum of varied employment opportunities in the bio-pharmaceuticals, chemicals and process industries.

Some of the job titles held by graduates include Process Technician, Operation Technician, Plant Maintenance Technician, Process Instrument Technician and Engineering Assistant. There are excellent opportunities for career advancement to supervisory positions and beyond. The challenge is for students to prepare themselves by upgrading their technical skills and knowledge by taking up higher-level courses.

### COURSE STRUCTURE

| S/N | Module Details   | Module Code   | Module Objectives   |
|-----|--|---|---|
| M1  | <b>Occupational Health, Safety and Security</b><br>60 hrs (T) 60 hrs (P)<br>Credits: 5<br>Prerequisite: Nil  | CE2106FP  | On completion of the module, students should be able to apply skills and knowledge in performing workplace housekeeping, responding in emergency situations and rendering first aid. They should also be able to apply skills and knowledge in workplace safety, confined space safety, safety audits, risk assessment, permit-to-work system, LOTO, and electrical safety.                           |
|     |  | Equivalent Codes<br>CE2011<br>CE2002P<br>CE2006P<br>CE2001PA<br>CE2102FP<br>CE2102FPR             |   |
| M2  | <b>Product Quality and Environment Standards</b><br>60 hrs (T) 60 hrs (P)<br>Credits: 7<br>Prerequisite: Nil | CE2107FP  | On completion of the module, students should be able to apply statistical process control, perform instrumental analysis on petroleum and pharmaceutical products, perform chromatography, spectroscopy and air-pollution control test. They also learn to conduct tests on effluent waste, perform water quality tests, carry out waste treatment facility operation and handle gas emission upsets. |
|     |  | Equivalent Code<br>Nil  |   |
| M3  | <b>Process Instrumentation and Control</b><br>60 hrs (T) 60 hrs (P)<br>Credits: 7<br>Prerequisite: Nil       | CE2108FP  | On completion of the module, students should be able to perform line tracing and monitor process parameters. They also learn to carry out manual valve operation, control valve with handwheel operation, control valve by-pass operation, and perform instrument functionality check.  |
|     |  | Equivalent Codes<br>CE2013<br>CE2003P<br>CE2007P<br>CE2002PA<br>CE2002PR<br>CE2103FP<br>CE2103FPR |   |
| M4  |  | CE2109FP  | On completion of the module, students should be able to carry out pump operation, filter  |

| S/N | Module Details   | Module Code   | Module Objectives  |
|-----|--|---|--|
|     | <b>Process Equipment and Operation</b><br>60 hrs (T) 60 hrs (P)<br>Credits: 7<br>Prerequisite: Nil                 | Equivalent Codes<br>CE2014<br>CE2004P<br>CE2008P<br>CE2003PA<br>CE2104FP<br>CE2104FPR                 | operation, heat exchanger operation, reactor operation, mixer operation and ejector operation. They also learn to load and unload material, perform inter-tank transfer, change-over of process equipment and collection of raw material and sampling. |
| M5  | <b>Plant Processes</b><br>60 hrs (T) 60 hrs (P)<br>Credits: 5<br>Prerequisite: Nil<br>Advised to complete CE2109FP | CE3105FP<br><br>Equivalent Codes<br>CE3012<br>CE3002P<br>CE3007P<br>CE3001PA<br>CE3101FP<br>CE3101FPR | On completion of the module, students should be able to carry out distillation operation, gas absorber and gas adsorber operation. They also learn to carry out extraction unit operation, evaporator operation and crystalliser operation.            |

**Choose ONLY one of the following modules:**

|     |   |   |   |
|-----|---|---|---|
| M6a | <b>Biologics and Pharmaceutical Processes</b><br>60 hrs (T) 60 hrs (P)<br>Credits: 7<br>Prerequisite: Nil<br>Advised to complete CE2109FP | CE3106FP  | On completion of the module, students should be able to perform seed and inoculum preparation activities, carry out bioreactor setup and process monitoring operation, perform CIP operation and SIP operation, monitor cell harvesting and filtration operation, perform chromatography column packing and operate large-scale chromatography and filtration equipment. They also learn to perform homogenisation and micronising operation, carry out scrubber operation, isolator operation, phase separation, equipment cleaning operation and waste pre-treatment operation. |
|     |   | Equivalent Code<br>Nil  |   |
| M6b | <b>Equipment Maintenance and Utilities</b><br>60 hrs (T) 60 hrs (P)<br>Credits: 7<br>Prerequisite: Nil<br>Advised to complete CE2109FP    | CE3204FP  | On completion of the module, students should be able to carry out reverse osmosis water plant operation, carry out boiler unit operation, carry out steam header and condenser unit operation and carry out compressed air unit operation. They also learn to perform maintenance on pipe system and equipment, check pump and compressor performance, troubleshoot abnormal conditions in pumps and compressors, and prepare process equipment for shutdown maintenance.   |
|     |   | Equivalent Codes<br>CE3011<br>CE3001P<br>CE3103P<br>CE3101PA<br>CE3201FP<br>CE3201FPR |   |

Abbreviations: T - Theory, P - Practical

**CREDITS FOR CERTIFICATION**

Total of 38 credits from successful completion of 6 modules

**VENUE**

ITE College East

Note:

- 1) Applicant must be free from colour appreciation deficiency.
- 2) The training schedule of lessons is subject to change.
- 3) Depending on demand, not all the modules in the CET *Nitec* in Technology courses will be offered in each intake. Where the modules are offered and there is insufficient enrolment, the classes will be cancelled and a full refund will be given to the affected students.