ADVANCING CUTTING-EDGE SKILLS AND PRODUCTIVITY

PRECISION
ENGINEERING

SINGAPORE WORKFORCE SKILLS QUALIFICATIONS
THE BACKBONE OF COMPLEX MANUFACTURING

Think of Precision Engineering (PE) as the force that powers a diverse range of industries such as aerospace, electronics, automotive, medical technology, and oil & gas. It is the cutting-edge skills and innovations in precision engineering that enable the design and production of complex and intricate components for many sophisticated machines and end-products. For example, advanced PE skills are involved in the manufacturing of aircraft engine fan blades, medical devices such as hearing aids, and drill bits used in oil exploration.

Over the years, Singapore’s PE sector has evolved from one that supported the consumer electronics and hard disk drive industries into an established and critical sector filled with players from contract manufacturers to full-solution providers that operate an entire value chain.

Today, the PE industry comprises over 2,800 companies dealing in machinery and systems, as well as precision modules and components. In 2013, the sector employed more than 89,000 workers and contributed S$33 billion (11%) to Singapore’s total manufacturing output and S$7.5 billion (15%) to its total manufacturing value-added per annum.

(Source: Singapore Economic Development Board).

THE FUTURE IS BRIGHT

Singapore plays host to the headquarters and R&D functions of many global precision engineering companies. The future of precision engineering in Singapore is brimming with growth possibilities as we continue to build on our strong industry partnerships to create a flourishing full-solutions precision engineering sector.

ESTABLISHED GLOBAL LEADERSHIP

Singapore accounts for:
- 10% of the global supply of contact lenses
- More than 10% of the global output for backend semiconductor equipment
- Half of the world’s thermal cyclers
- More than 50% of the world’s microarray
- 70% of the world’s jack-up oil rigs

LOCAL FOCUS

The strong precision engineering capabilities in Singapore have attracted 9 out of the 10 top global wafer fabrication equipment companies to procure significantly from local-based suppliers.

21% OF TOTAL MANUFACTURING WORKFORCE

In 2013, the Precision Engineering Industry employed more than 89,000 people, equivalent to 21% of Singapore’s manufacturing workforce.

LEADING IN ADVANCED CAPABILITIES

Singapore manufactures wafer inspection tools that are engineered to identify nano-scale defects - comparable in magnitude to spotting a strand of white hair about 2,000 feet above ground, or about four times the height of the Singapore Flyer.
The Singapore Workforce Skills Qualifications (WSQ) is a national credentialing system. It trains, develops, assesses and recognises individuals for the key competencies that companies look for in potential employees. WSQ is based on national standards developed by the Singapore Workforce Development Agency (WDA) in collaboration with various industries comprising industry sectoral frameworks which serve to:

1. **PROFESSIONALISE**
   - the industry, particularly where recognition of Continuing Education and Training (GET) qualifications are lacking.

2. **IMPROVE**
   - labour mobility allowing companies in growing industries to easily recruit workers with the necessary skills whilst improving opportunities for workers to enter these industries.

3. **PROVIDE**
   - more opportunities for workers to enter growing industries.

WHAT IS PE WSQ FRAMEWORK?

The Singapore Workforce Skills Qualifications System for Precision Engineering (PE WSQ) is a national skills training system that was developed jointly by the industry and WDA. The Precision Engineering Industry Skills and Training Council (PE ISTC), comprised of employers, industry associations, relevant government agencies, industry union and key training providers, spearheaded the development of the PE framework.
The Precision Engineering WSQ qualifications provide an avenue for individuals to upgrade themselves. These qualifications contain the Core Competencies (Common Core and Sector Core) and Specialisation Electives components.

**Core Competencies:**
Core competencies are common subjects (at different levels throughout the qualifications) which comprises a range of compulsory know-hows and attributes required for the area of work. They are made up of both Common Core and Sector Core.
- **Common Core:** Common subjects which are applicable across all industries at each level and specific to each industry sector or level.
- **Sector Core:** Compulsory competencies required for the area of work and specific industry sector. Subjects are sector specific and foundational for each Industry Sector or level.

**Specialisations Electives:**
A range of subjects to choose from which is applicable at each level and specific to each industry sector to suit individual’s work requirement.

**Nominal Hours for each Competency:**
Competency hours can range from a minimum of 20 hours to a maximum of 80 hours. This represents contact training hours required to complete the training for the particular competency and it excludes practice hours.

### Qualifications & Levels:

<table>
<thead>
<tr>
<th>Level</th>
<th>Qualification</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>Level 6</td>
<td>Senior Specialist Professional - Graduate Diploma</td>
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<td>Level 5</td>
<td>Specialist Professional - Specialist Diploma</td>
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<td>Level 4</td>
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<td>Level 3</td>
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<tr>
<td>Level 2</td>
<td>Senior Craftsman - Higher Certificate</td>
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<td>Level 1</td>
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</tbody>
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Note: The rules and description indicated above are typical and based on assumptions in the PE WSQ. A complete description of the rules and guidelines is contained in the Precision Engineering Workforce Skills Qualification System Policy documentation.
HOW CAN WSQ BENEFIT YOU?

- Assist with Career path planning for entry into a new industry
- Skill upgrading for career advancements through clear progression pathways
- Present more clearly defined skills sets to potential employers via new qualifications and certifications
- Obtain portable credentials for existing skills
- Assess and benchmark individual capabilities against industry-established work standards
- Support and promote best practices in the workplace

TESTIMONIALS

“...the PE WSQ Graduate Diploma in Medical Technology Manufacturing was the turnaround in my career. It showed me what the MedTech Industry entails and it opened me to possibilities in the industry. It equipped me with the skills to make inroads into the MedTech industry and carved a niche for myself.”

Leslie Tan
Managing Director, Royal Bussan Singapore Pte Ltd

“...I am impressed by the quality of the PE WSQ Graduate Diploma Programme which focuses on equipping us with practical industry skills and up-to-date knowledge on regulatory and quality issues which are important in this highly regulated industry. I am now more confident and better equipped to do my job...”

Ms Lee Siow Wei
Engineer, Becton Dickinson Medical Singapore Pte Ltd

HOW CAN YOU EMBARK ON SKILLS UPGRADING?

1. Identify the skills which you require. Refer to an overview for the various types of training under PE WSQ competency map on pages 6 and 7.

2. Interested in taking up WSQ Qualifications or individual modules to advance in your career or to bridge skills gap? Page 13 to 77 will provide you with a holistic range of courses for operation, supervisory and managerial levels.

3. After identifying the suitable programmes/modules, you may approach our Approved Training Organisations to find out more about the course details, fees and funding. Contact details are listed on pages 78 and 79.
HOW CAN WSQ BENEFIT THE EMPLOYER?

- Benchmark best practices
- Improve and develop job descriptions
- Improve performance management systems and training programmes
- Establish clearly defined career paths for employees
- Guide training needs analysis
- Facilitate recruiting competent staff who are equipped with industry-specific capabilities and job-specific requirements
- Strengthen in-house training capabilities

EMPLOYERS

HOW CAN COMPANIES DEVELOP THEIR WORKFORCE?

1. Identify skills gap in your employees.
   The PE WSQ framework can help you fill in skills gaps that your company employees may have.

2. Select relevant qualifications or modules.
   Interested in taking up WSQ qualifications or individual modules to advance in your career or to bridge skills gap? Pages 13 to 77 will provide you with a holistic range of programmes/modules for operations, supervisory and managerial levels.

3. Contact our Approved Training Organisation.
   After identifying the suitable programmes/modules, you may approach our Approved Training Organisations to find out more about the course details, fees and funding. Contact details are listed on pages 78 and 79.

4. To be an In-House Approved Training Organisation.
   If you have training capabilities within your company, you may consider becoming an in-House Approved Training Organisation. Please contact WDA for more information.

TESTIMONIALS

"For the PE industry to remain relevant, we need to enhance our skills and competency level to that of advanced countries so that we can compete more effectively with higher-value additions. PE WSQ provides a flexible and modular training programme which enables the employee to learn continuously at their own pace. It also allows for the companies to chart a career path for employees, as well as achieve greater organisational productivity and efficacy with a highly-skilled workforce."

Dr. Moh Chong Tau
Chairman of the Precision Engineering Industry Skills and Training Council (PE ISTC), President and CEO, Makino Asia Pte Ltd

"PE WSQ enhances the skills and productivity of my workers and, in the process, improves my business competitiveness."

Ms. Katherine Foo Yoke Khan
Regional Managing Director, Advanex (Singapore) Pte Ltd
WSQ Follow Good Cleanroom Practices

Description: This course is one of the core units in all sectors and functional areas of manufacturing industry. It specifies the skills and knowledge required by people to follow good practices when they are carrying out daily tasks in Cleanroom.

Module: Follow Good Cleanroom Practices

Statement of Attainment Awarded: WSQ Follow Good Cleanroom Practices

Target Audience: Personnel in the manufacturing industry such as machine specialists, production floor operators, planners, and technicians.

Course Duration: 8 hours

Course Fee:
- Member Full Fee: $142.50 (excluding GST)
- Nett Fee: (Singaporeans/PRs): $14.25 (excluding GST)
- Non-Member Full Fee: $190 (excluding GST)
- Nett Fee: (Singaporeans/PRs): $19 (excluding GST)

Fees are subject to changes by the training providers.

WSQ Apply Biomedical Products’ Assembly Skills

Description: This course stipulates the knowledge and application skills needed in performing biomedical products’ assembly skills by using the appropriate hand tools, measuring instruments and optical instruments. It also states the requirements on carrying out housekeeping of the work area.

Module: Apply Biomedical Products’ Assembly Skills

Statement of Attainment Awarded: WSQ Apply Biomedical Products’ Assembly Skills

Target Audience: Operational level personnel working in MedTech industry or handling biomedical products.

Course Duration: 35 hours

Course Fee:
- Member Full Fee: $300 (excluding GST)
- Nett Fee: (Singaporeans/PRs): $30 (excluding GST)
- Non-Member Full Fee: $390 (excluding GST)
- Nett Fee: (Singaporeans/PRs): $39 (excluding GST)

Fees are subject to changes by the training providers.
### WSQ Operate Hydraulic Systems

**Description**
The course aims to provide participants with basic knowledge of the construction and function of hydraulic and electrical components as well as to develop the ability to read, design and construct simple hydraulic circuits.

**Module**
Operate Hydraulic Systems

**Statement of Attainment Awarded**
WSQ Operate Hydraulic Systems

**Target Audience**
Industrial Operators, technicians, designers and engineers.

**Course Duration**
32 hours

**Course Fee**
- Full Fee: $900 (excluding GST)
- Nett Fee: (Singaporeans/PRs): $90 (excluding GST)

Fees are subject to changes by the training providers.

### WSQ Operate Electrical Sensors

**Description**
The course aims to provide participants with knowledge of operating principles of the various types of proximity sensors used for handling and processing technology, including the analysis of sensing range and response characteristics of these sensors. The participant would also be able to identify and connect the sensors.

**Module**
Operate Electrical Sensors

**Statement of Attainment Awarded**
WSQ Operate Electrical Sensors

**Target Audience**
Industrial Operators, technicians, designers and engineers.

**Course Duration**
32 hours

**Course Fee**
- Full Fee: $700 (excluding GST)
- Nett Fee: (Singaporeans/PRs): $70 (excluding GST)

Fees are subject to changes by the training providers.

### WSQ Certified Precision Engineering Specialist (Manufacturing & Production)

**Description**
Participants who complete the course are able to apply proper safe working procedures and practices in an engineering workshop, and operate conventional machines to produce a variety of engineering components. They will have the knowledge to interpret blueprints requirement for measuring components and verifying the dimensions achieved.

**Course/Modules**
Select any 6 modules:
1. Interpret Technical Drawings and Blueprints
2. Perform General Machining
3. Use Precision Measuring Equipment
4. Apply Computer Aided Manufacturing (CAM) Processes
5. Perform EDM-CNC Wire Cut Machine Operations
6. Perform CNC Milling & Programming
7. Perform CNC Turning & Programming

**Qualification Awarded**
WSQ Certified Precision Engineering Specialist (Manufacturing & Production)

**Target Audience**
This programme is suitable for those who are currently employed or wish to be employed in the engineering industry as Machinery Mechanic or Machine / Tool Setter.

**Course Duration**
40 - 80 hours per module, 2 - 3 evenings a week.

**Course Fee**
- Full Fee: $1,010 to $1,680 per module (including GST)
- Nett Fee: (Singaporeans/PRs): $101 to $168 per module (including GST)

Fees are subject to changes by the training providers.
In the provided text, we can see information about various courses offered by the Institute of Technical Education (ITE) and SETSCO Services PTE LTD. The text is structured in a similar format for each course, detailing the course description, course modules, target audience, qualification awarded, course duration, and course fees. Each section is followed by additional details specific to the course, such as module descriptions and fees.

For example, the WSQ Certified Mechatronic Systems Assistant course includes the following details:

- **Description**: The WSQ Certified Mechatronic Systems Assistant programme is an internationally recognised programme developed by Siemens Professional Education (SPE), Berlin.
- **Course/Modules**:
  1. Electrical Components
  2. Mechanical Components and Electrical Drives
  3. (Electrical) Pneumatic and Hydraulic Control Circuits
  4. Digital Fundamentals and Programmable Logic Controller (PLC)
- **Qualification Awarded**: WSQ Certified Mechatronic Systems Assistant
- **Target Audience**: This programme is suitable for those who are currently employed or wished to be employed in the manufacturing and automation industry as Mechatronic Systems Specialist or Automated Machine/Equipment Specialist.
- **Course Duration**: Each module consists of 60 hours of theory and practical lessons.
- **Course Fee**: Full Fee: $2,820 per module (including GST)
  Nett Fee: (Singaporeans/PRs): $2,820 per module (including GST)
  Fees are subject to changes by the training providers.

Similarly, other courses such as WSQ Perform Ultrasonic Testing (Level 1) and WSQ Perform Radiographic Testing (Level 1) also follow this structure, providing detailed information about the course content, target audience, qualification awarded, course duration, and course fees.
### WSQ Perform Advanced Magnetic Particle Testing (Level II)

**Description**
Magnetic Particle Testing (MT) is a non-destructive testing (NDT) process for detecting surface and slightly subsurface discontinuities in ferroelectric materials such as iron, nickel, cobalt, and some of their alloys. MT is used to detect casting, forging and welding surface defects such as hairline cracks, surface porosity, leaks in new products, and fatigue cracks on in-service components.

**Module**
Perform Advanced Magnetic Particle Testing (Level II)

**Statement of Attainment Awarded**
WSQ Perform Advanced Magnetic Particle Testing (Level II)

**Target Audience**
Personnel working in Oil and Gas, Manufacturing, petrochemical, Power Generation and Power Stations, Ship Building / Ship Repair and Construction, Offshore Fabrication, Railways, Service and maintenance and Metal fabrication & handling industrial inspections.

**Course Duration**
24 hours

**Course Fee**
Full Fee: $1,200 (excluding GST)
Nett Fee: (Singaporeans/PRs): $120 (excluding GST)

*Fees are subject to changes by the training providers.*

### WSQ Perform Visual Testing (Level II)

**Description**
Visual Testing (VT) is a non-destructive testing (NDT) process for detecting surface discontinuities in any materials like iron, nickel, cobalt, and some of their alloys. We can inspect and identify welding surface defects such as root penetration, weld reinforcement, spatters, undercut, surface cracks, porosity of new and in-service components.

**Module**
Perform Visual Testing Level II

**Statement of Attainment Awarded**
WSQ Perform Visual Testing Level II

**Target Audience**
Personnel working in Oil and Gas, Manufacturing, petrochemical, Power Generation and Power Stations, Ship Building / Ship Repair and Construction, Offshore Fabrication, Railways, Service and maintenance and Metal fabrication & handling industrial inspections.

**Course Duration**
30 hours

**Course Fee**
Full Fee: $1,500 (excluding GST)
Nett Fee: (Singaporeans/PRs): $70 (excluding GST)

*Fees are subject to changes by the training providers.*

### WSQ Understanding Pneumatic Technology in Automation

**Description**
The course aims to provide participants with a basic knowledge of the construction and function of pneumatic and electrical components as well as to develop the ability to read, design and construct simple pneumatic and electro-pneumatic circuits.

**Module**
Understanding Pneumatic Technology in Automation

**Statement of Attainment Awarded**
WSQ Understanding Pneumatic Technology in Automation

**Target Audience**
Industrial Operators, technicians, designers and engineers.

**Course Duration**
32 hours

**Course Fee**
Full Fee: $600 (excluding GST)
Nett Fee: (Singaporeans/PRs): $60 (excluding GST)

*Fees are subject to changes by the training providers.*

### WSQ TPM of Pneumatic Systems

**Description**
The course aims to provide participants with the knowledge of pneumatic control systems. The participant would be able to maintain, troubleshoot and design pneumatic and electro-pneumatic circuits.

**Module**
TPM of Pneumatic Systems

**Statement of Attainment Awarded**
WSQ TPM of Pneumatic Systems

**Target Audience**
Industrial personnel, maintenance staff, technicians, operators, designers and engineers.

**Course Duration**
32 hours

**Course Fee**
Full Fee: $700 (excluding GST)
Nett Fee: (Singaporeans/PRs): $70 (excluding GST)

*Fees are subject to changes by the training providers.*
### WSQ Maintain and Repair Hydraulic Systems

**Description**
The course aims to provide participants with the knowledge of pneumatic control systems. The participant would be able to maintain, troubleshoot and design pneumatic and electro-pneumatic circuits.

**Module**
Maintain and Repair Hydraulic Systems

**Statement of Attainment Awarded**
WSQ Maintain and Repair Hydraulic Systems

**Target Audience**
Industrial personnel, maintenance staff, technicians, operators, designers and engineers.

**Course Duration**
32 hours

**Course Fee**
- Full Fee: $950 (excluding GST)
- Nett Fee: (Singaporeans/PRs): $95 (excluding GST)

Fees are subject to changes by the training providers.

### WSQ Operate Programmable Logic Controller

**Description**
The course aims to provide participants with knowledge of basic electrical components and be able to set-up and operate a Programmable Logic Controller (PLC).

**Module**
Operate Programmable Logic Controller

**Statement of Attainment Awarded**
WSQ Operate Programmable Logic Controller

**Target Audience**
Engineers, technicians, maintenance staff, designers and trainers.

**Course Duration**
32 hours

**Course Fee**
- Full Fee: $750 (excluding GST)
- Nett Fee: (Singaporeans/PRs): $75 (excluding GST)

Fees are subject to changes by the training providers.

### WSQ Implement Programming of a Programmable Logic Controller

**Description**
The course aims to provide the participant with knowledge to translate complex control tasks into operational PLC programs. The participant would be able to write and simulate the control system based on IEC 61131-3 standard. They will be able to program modular production systems with Ethernet communication.

**Module**
Implement Programming of a Programmable Logic Controller

**Statement of Attainment Awarded**
WSQ Implement Programming of a Programmable Logic Controller

**Target Audience**
Engineers, technicians, maintenance staff, designers and trainers.

**Course Duration**
32 hours

**Course Fee**
- Full Fee: $750 (excluding GST)
- Nett Fee: (Singaporeans/PRs): $75 (excluding GST)

Fees are subject to changes by the training providers.
### WSQ Design Handling Systems in Industrial Automation

**Description**
The course aims to provide the participant with the fundamental knowledge and skill on handling technology with pneumatics for industrial handling and assembly applications.

**Module**
Design Handling Systems in Industrial Automation

**Statement of Attainment Awarded**
WSQ Design Handling Systems in Industrial Automation

**Target Audience**
Industrial personnel, technicians, operators, designers and engineers.

**Course Duration**
32 hours

**Course Fee**
- Full Fee: $750 (excluding GST)
- Nett Fee: (Singaporeans/PRs): $75 (excluding GST)

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### WSQ Design Electric Drives and Electromechanical Systems

**Description**
The course aims to provide the participant with the fundamental knowledge and skill on the different electric motors and its application. Participants will also be able to incorporate the motors to the electrical drive units.

**Module**
Design Electric Drives and Electromechanical Systems

**Statement of Attainment Awarded**
WSQ Design Electric Drives and Electromechanical Systems

**Target Audience**
Industrial personnel, technicians, operators, designers and engineers.

**Course Duration**
32 hours

**Course Fee**
- Full Fee: $750 (excluding GST)
- Nett Fee: (Singaporeans/PRs): $75 (excluding GST)

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### WSQ Maintain Hydraulic and Pneumatic System Components

**Description**
The course aims to provide participants with the knowledge and skills of maintaining hydraulic and pneumatic components and will be able to apply them to the workplace.

**Module**
Maintain Hydraulic and Pneumatic System Components

**Statement of Attainment Awarded**
WSQ Maintain Hydraulic and Pneumatic System Components

**Target Audience**
Industrial personnel, maintenance staff, technicians, operators, designers and engineers.

**Course Duration**
32 hours

**Course Fee**
- Full Fee: $600 (excluding GST)
- Nett Fee: (Singaporeans/PRs): $60 (excluding GST)

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### WSQ Operate Process Automation Valves

**Description**
The course aims to provide participants with the knowledge and skills to operate valves used in process automation and to be able to do valve/drive selection based on materials and standards.

**Module**
Operate Process Automation Valves

**Statement of Attainment Awarded**
WSQ Operate Process Automation Valves

**Target Audience**
Industrial personnel, maintenance staff, technicians, operators, designers and engineers.

**Course Duration**
32 hours

**Course Fee**
- Full Fee: $700 (excluding GST)
- Nett Fee: (Singaporeans/PRs): $70 (excluding GST)
**WSQ Apply Pneumatics in Water/Wastewater Treatment**

**Description**
The course aims to provide participants with the knowledge of process automation in water-related plants, towards the increased use of pneumatic drives instead of electric drives. This makes an important contribution to the process reliability of these plants.

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<th>Module</th>
<th>Statement of Attainment Awarded</th>
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<tr>
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<td>WSQ Apply Pneumatics in Water/Wastewater Treatment</td>
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<thead>
<tr>
<th>Target Audience</th>
<th>Course Duration</th>
<th>Course Fee</th>
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</thead>
</table>
| Industrial personnel, maintenance staff, technicians, operators, designers and engineers. | 24 hours | Full Fee: $600 (excluding GST)  
Nett Fee: (Singaporeans/PRs): $60 (excluding GST) |

Fees are subject to changes by the training providers.

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**WSQ Higher Certificate in Aerospace Manufacturing**

**Description**
The WSQ Higher Certificate in Aerospace Manufacturing programme maps out the essential cross-cutting skills and competencies needed by the precision engineering industry. Participants who complete the course will be able to apply proper safe working procedures and practices in an engineering workshop. They will know how to operate multi-axis CNC machines, non-conventional cutting and surface preparation and finishing machines to produce a variety of aerospace components. They will also have the knowledge of how to set up and operate optical digitiser, evaluate geometrical tolerance and conduct non-destructive testing on aerospace components.

<table>
<thead>
<tr>
<th>Course/Modules</th>
<th>Common Core</th>
</tr>
</thead>
</table>
| 1. Apply Quality Systems  
2. Apply Teamwork in the Workplace  
3. Apply WSH Policy  
4. Apply 5S Techniques in Manufacturing |

<table>
<thead>
<tr>
<th>Sector Core</th>
<th>Specialisation Electives (select any 2)</th>
</tr>
</thead>
</table>
| 5. Operate Basic Measuring Devices  
6. Perform Aerospace Material Hot Processing  
7. Perform Aerospace Surface Preparation and Finishing  
8. Perform Non-Destructive Testing  
9. Perform Aerospace Surface Coating  
10. Perform Geometrical Tolerancing and Inspection  
11. Perform Diffusion Bonding of Aerospace Material  
12. Perform Advanced Tungsten Arc Welding  
13. Set-up & Operate Coordinate Measuring Machine  
14. Perform Non-Conventional Cutting Process  
15. Perform Aerospace Machining  
16. Perform Optical Digitising |

**Qualification Awarded**
WSQ Higher Certificate in Aerospace Manufacturing

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<tr>
<th>Target Audience</th>
<th>Course Duration</th>
<th>Course Fee</th>
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| This programme is suitable for those who are currently employed or wish to be employed in the engineering industry such as Manufacturing Assistant Engineer, Production Technician, CNC Setup Technician and Machinist etc. | 16 - 72 hours per module, to be advised by ITE. | Full Fee: $460 to $3,449 per module (including GST)  
Nett Fee: (Singaporeans/PRs): $46 to $345 per module (including GST) |

Fees are subject to changes by the training providers.
### WSQ Perform Liquid Penetrant Testing (Level 1)

**Description**
Upon completion of the course, participants will have the knowledge and application skills to perform liquid penetrant testing in a range of industrial applications within the precision engineering arena and will be able to apply them at the workplace according to written instructions and under the supervision of Liquid Penetrant Testing Level 2 or Level 3 personnel.

**Module**
Perform Liquid Penetrant Testing (Level 1)

**Statement of Attainment Awarded**
WSQ Perform Liquid Penetrant Testing (Level 1)

**Target Audience**
NDT personnel, maintenance personnel, quality assurance / quality control inspectors, engineers, surveyors, technicians, trainees in the aerospace, metal fabrication, oil refinery, petrochemical, offshore, shipbuilding, ship-repairing and building construction industries.

**Course Duration**
24 hours

**Course Fee**
- Full Fee: $600 (excluding GST)
- Nett Fee: (Singaporeans/PRs): $60 (excluding GST)

*Fees are subject to changes by the training providers.*

### WSQ Perform Advanced Dye Penetrant Testing (Level 2)

**Description**
The course covers all theory aspects of the method and provides practical hands-on workshop experience of the various techniques. The course meets the training requirements for individuals wishing to take a certification examination in the PCN or ASNT scheme.

**Module**
Perform Advanced Dye Penetrant Testing (Level 2)

**Statement of Attainment Awarded**
WSQ Perform Advanced Dye Penetrant Testing (Level 2)

**Target Audience**
NDT personnel, maintenance personnel, quality assurance / quality control inspectors, engineers, surveyors, technicians, trainees in the aerospace, metal fabrication, oil refinery, petrochemical, offshore, shipbuilding, ship-repairing and building construction industries.

**Course Duration**
45 hours

**Course Fee**
- Full Fee: $1,200 (excluding GST)
- Nett Fee: (Singaporeans/PRs): $120 (excluding GST)

*Fees are subject to changes by the training providers.*

### WSQ Perform Magnetic Particle Testing (Level 1)

**Description**
Upon completion of the course, participants will have the knowledge and application skills to perform magnetic particle testing in a range of industrial applications within the precision engineering arena and will be able to apply them at the workplace according to written instructions and under the supervision of Level II or Level III in magnetic particle testing.

**Module**
Perform Magnetic Particle Testing (Level 1)

**Statement of Attainment Awarded**
WSQ Perform Magnetic Particle Testing (Level 1)

**Target Audience**
NDT personnel, maintenance personnel, quality assurance / quality control inspectors, engineers, surveyors, technicians, trainees in the aerospace, metal fabrication, oil refinery, petrochemical, offshore, shipbuilding, ship-repairing and building construction industries.

**Course Duration**
24 hours

**Course Fee**
- Full Fee: $600 (excluding GST)
- Nett Fee: (Singaporeans/PRs): $60 (excluding GST)

*Fees are subject to changes by the training providers.*

### WSQ Perform Advanced Magnetic Particle Testing (Level 2)

**Description**
The course covers all theory aspects of the method and practical “hands-on” workshop experiences of the various techniques involved Magnetic Particle Testing and meet the PCN requirements for MPI Level II personnel qualification.

**Module**
Perform Advanced Magnetic Particle Testing (Level 2)

**Statement of Attainment Awarded**
WSQ Perform Advanced Magnetic Particle Testing (Level 2)

**Target Audience**
NDT personnel, maintenance personnel, quality assurance / quality control inspectors, engineers, surveyors, technicians, trainees in the aerospace, metal fabrication, oil refinery, petrochemical, offshore, shipbuilding, ship-repairing and building construction industries.

**Course Duration**
45 hours

**Course Fee**
- Full Fee: $1,200 (excluding GST)
- Nett Fee: (Singaporeans/PRs): $120 (excluding GST)

*Fees are subject to changes by the training providers.*
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<tr>
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</thead>
</table>
| | WSQ Perform Advanced Ultrasonic Testing (Level 2) | NDT personnel, maintenance personnel, quality assurance / quality control inspectors, engineers, surveyors, technicians, trainees in the aerospace, metal fabrication, oil refinery, petrochemical, offshore, shipbuilding, ship-repairing and building construction industries. | 87 hours | Full Fee : $2,700 (excluding GST)  
Nett Fee (Singaporeans/PRs): $270 (excluding GST) |
| | WSQ Perform Advanced Radiographic Testing (Level 2) | NDT personnel, maintenance personnel, quality assurance / quality control inspectors, engineers, surveyors, technicians, trainees in the aerospace, metal fabrication, oil refinery, petrochemical, offshore, shipbuilding, ship-repairing and building construction industries. | 90 hours | Full Fee : $2,700 (excluding GST)  
Nett Fee (Singaporeans/PRs): $270 (excluding GST) |
| | WSQ Perform Advanced Radiographic Interpretation (Level 2) | NDT personnel, maintenance personnel, quality assurance / quality control inspectors, engineers, surveyors, technicians, trainees in the aerospace, metal fabrication, oil refinery, petrochemical, offshore, shipbuilding, ship-repairing and building construction industries. | 87 hours | Full Fee : $2,700 (excluding GST)  
Nett Fee (Singaporeans/PRs): $270 (excluding GST) |
### HIGHER CERTIFICATE COURSES

**SETSSCO SERVICES PTE LTD**

Enquiries & Applications:
Mr Andy Cheong Kok Fei
Tel: 6895 0626
Email: andycheong@setsco.com

**Email:** andycheong@setsco.com

**Website:** www.setsco.com

#### WSQ Perform Visual Testing (Level 2)

<table>
<thead>
<tr>
<th>Description</th>
<th>The training is intended to provide participants with the knowledge and skill needed to conduct visual testing of general engineering multi-sector products such as castings, welds and wrought products in the form of materials, components and fabrications in accordance with industry standards, codes and specifications or written NDT instructions. Participants are subject to competency-based assessments at the end of the course.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Module</td>
<td>Perform Visual Testing (Level 2)</td>
</tr>
<tr>
<td>Statement of Attainment Awarded</td>
<td>WSQ Perform Visual Testing (Level 2)</td>
</tr>
<tr>
<td>Target Audience</td>
<td>NDT personnel, maintenance personnel, quality assurance / quality control inspectors, engineers, surveyors, technicians, trainees in the aerospace, metal fabrication, oil refinery, petrochemical, offshore, shipbuilding, ship-repairing and building construction industries.</td>
</tr>
<tr>
<td>Course Duration</td>
<td>45 hours</td>
</tr>
</tbody>
</table>
| Course Fee | Full Fee: $2,500 (excluding GST)  
Nett Fee: (Singaporeans/PRs): $250 (excluding GST) | Fees are subject to changes by the training providers. |

#### WSQ Perform Advanced Eddy Current Testing (Level 2)

<table>
<thead>
<tr>
<th>Description</th>
<th>The training is intended to provide participants with the knowledge and skill needed to conduct testing of welds using eddy current techniques. Participants are subject to competency-based assessments at the end of the course. The training also meets the ASNT Level 2 requirements for the testing of welds using eddy current techniques.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Module</td>
<td>Perform Advanced Eddy Current Testing (Level 2)</td>
</tr>
<tr>
<td>Statement of Attainment Awarded</td>
<td>WSQ Perform Advanced Eddy Current Testing (Level 2)</td>
</tr>
<tr>
<td>Target Audience</td>
<td>NDT personnel, maintenance personnel, quality assurance / quality control inspectors, engineers, surveyors, technicians, trainees in the aerospace, metal fabrication, oil refinery, petrochemical, offshore, shipbuilding, ship-repairing and building construction industries.</td>
</tr>
<tr>
<td>Course Duration</td>
<td>87 hours</td>
</tr>
</tbody>
</table>
| Course Fee | Full Fee: $2,700 (excluding GST)  
Nett Fee: (Singaporeans/PRs): $270 (excluding GST) | Fees are subject to changes by the training providers. |

### ADVANCED CERTIFICATE COURSES

**CAD-IT CONSULTANTS (ASIA) PTE LTD**

Enquiries & Applications:
Ms Jessie Chan / Miko Ngju / Precilla Eurico
Tel: 6508 7575
Email: training@cadit.com.sg

**Website:** www.cadit.com.sg

#### WSQ Apply Engineering Simulation Fundamentals

<table>
<thead>
<tr>
<th>Description</th>
<th>The course highlights the practical applications of finite element theory. It stipulates how to create and modify geometry in preparation for analysis, as well as generate quality mesh for their finite element analysis (FEA) and/or computational fluid dynamics (CFD) simulations.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Module</td>
<td>Apply Engineering Simulation Fundamentals</td>
</tr>
<tr>
<td>Statement of Attainment Awarded</td>
<td>WSQ Apply Engineering Simulation Fundamentals</td>
</tr>
</tbody>
</table>
| Target Audience | • Working professionals with engineering background who wish to upgrade their Computer-aided Engineering (CAE) skills  
• Engineers/Technical Managers who need a refresher course on basic CAE skills |
| Pre-Requisites | Engineering knowledge is required. Familiarity with computer (PC or workstation) and basic knowledge of Computer Aided Engineering (CAE) are useful. |
| Course Duration | 5 days, 40 hours                                                      |
| Course Fee | Full Fee: $4,000 (excluding GST)  
Nett Fee: (Singaporeans/PRs): $400 (excluding GST) | Fees are subject to changes by the training providers. |

#### WSQ Perform Engineering Simulation for the Electronics Industry

<table>
<thead>
<tr>
<th>Description</th>
<th>The course focuses on applications in the Electronics industry, is recommended for engineers who wish to perform engineering analyses related to Electronics products and processes. It stipulates how to perform coupled physics analyses, analyze thermal response of structures and components, evaluate cooling solutions with air flow dynamics and perform drop test analyses.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Module</td>
<td>Perform Engineering Simulation for the Electronics Industry</td>
</tr>
<tr>
<td>Statement of Attainment Awarded</td>
<td>WSQ Perform Engineering Simulation for the Electronics Industry</td>
</tr>
</tbody>
</table>
| Target Audience | • Working professionals with engineering background who wish to upgrade their Computer-aided Engineering (CAE) skills  
• Engineers/Technical Managers who need a refresher course on CAE skills in electronics design/thermal/drop test analysis |
| Pre-Requisites | Engineering knowledge is required. Familiarity with computer (PC or workstation) and basic knowledge of Computer Aided Engineering (CAE) are useful. |
| Course Duration | 8 days, 64 hours                                                      |
| Course Fee | Full Fee: $6,400 (excluding GST)  
Nett Fee: (Singaporeans/PRs): $640 (excluding GST) | Fees are subject to changes by the training providers. |
**WSQ Perform Structural Simulation for Design Verification**

**Description**
The course stipulates how to perform Finite Element Analysis (FEA) simulations, including linear analyses such as static structural, modal and thermal analyses, and nonlinear analyses such as large deflection, plasticity and contact. It also focuses on how to utilize a design optimization application by studying, quantifying and graphing various structural, thermal and flow responses on parts and assemblies.

**Module**
Perform Structural Simulation for Design Verification

**Statement of Attainment Awarded**
WSQ Perform Structural Simulation for Design Verification

**Target Audience**
- Working professionals with engineering background who wish to upgrade their Computer-aided Engineering (CAE) skills in structural analysis
- Engineers/Technical Managers who need a refresher course on CAE skills in structural analysis

**Pre-Requisites**
Engineering knowledge is required. Familiarity with computer (PC or workstation) and basic knowledge of Computer Aided Engineering (CAE) are useful.

**Participants must have completed the following course (or its equivalent):**
- Apply Engineering Simulation Fundamentals

**Course Duration**
5 days, 40 hours.

**Course Fee**
- Full Fee: $4,000 (excluding GST)
- Nett Fee: (Singaporeans/PRs): $400 (excluding GST)

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**WSQ Perform CFD Simulation for Design Verification**

**Description**
The course is recommended for engineers who wish to analyze the general fluid flow analysis using general-purpose Computational Fluid Dynamics (CFD) tool. The Standard covers the basic knowledge about CFD, geometry modeling, meshing and fluid domain extraction. It stipulates how to setup the boundary and initial conditions, how to solve and post-process the results, as well as the basic procedures for operating the user-defined functions (UDF) programming and some advanced physics.

**Module**
Perform CFD Simulation for Design Verification

**Statement of Attainment Awarded**
WSQ Perform CFD Simulation for Design Verification

**Target Audience**
- Working professionals with engineering background who wish to upgrade their Computer-aided Engineering (CAE) skills in Computational Fluid Dynamics
- Engineers/Technical Managers who need a refresher course on CAE skills in Computational Fluid Dynamics

**Pre-Requisites**
Engineering knowledge is required. Familiarity with computer (PC or workstation) and basic knowledge of Computer Aided Engineering (CAE) are useful.

**Participants must have completed the following course (or its equivalent):**
- Apply Engineering Simulation Fundamentals

**Course Duration**
5 days, 40 hours.

**Course Fee**
- Full Fee: $4,000 (excluding GST)
- Nett Fee: (Singaporeans/PRs): $400 (excluding GST)

Fees are subject to changes by the training providers.
WSQ Perform Industry-Specific Engineering Analysis

**Description**
The course stipulates how to utilize an innovation tool to rapidly, yet systematically, circumvent barriers that traditionally impede innovation. It covers the use of inventive problem solving principles and methodologies for engineering, through applications of Root Cause Analysis, Theory of Inventive Problem Solving (TRIZ), Function modelling and Innovation Trend Analysis.

**Module**
Perform Industry-Specific Engineering Analysis

**Statement of Attainment Awarded**
WSQ Perform Industry-Specific Engineering Analysis

**Target Audience**
Engineering professionals and Technical Managers involved in research and development works who wish to learn innovative R&D skills

**Pre-Requisites**
Engineering knowledge is required. Familiarity with computer (PC or workstation) and basic knowledge of Computer Aided Engineering (CAE) are useful.

**Course Duration**
5 days, 40 hours.

**Course Fee**
- Full Fee: $4,000 (excluding GST)
- Nett Fee: (Singaporeans/PRs): $400 (excluding GST)

Fees are subject to changes by the training providers.

WSQ Perform Engineering Simulation for Built Environment & HVAC Design

**Description**
The course focuses on applications in the heating, ventilation and air-conditioning (HVAC) industry as well as Build Environment design, is recommended for engineers who wish to perform airflow modelling using Computational Fluid Dynamics (CFD) analysis. It stipulates how to analyze airflow modelling, heat transfer mechanisms, turbulence characteristics, and multispecies and multiphase flows.

**Module**
Perform Engineering Simulation for Built Environment & HVAC Design

**Statement of Attainment Awarded**
WSQ Perform Engineering Simulation for Built Environment & HVAC Design

**Target Audience**
- Working professionals with engineering background who wish to upgrade their Computer-aided Engineering (CAE) skills in advanced CFD analysis
- Engineers/Technical Managers who need a refresher course on CAE skills in advanced CFD analysis

**Pre-Requisites**
Engineering knowledge is required. Familiarity with computer (PC or workstation) and basic knowledge of Computer Aided Engineering (CAE) are useful.

Participants must have completed the following course (or its equivalent):
- Apply Engineering Simulation Fundamentals

Participants should preferably have completed the following course:
- Perform CFD Simulation for Design Verification

**Course Duration**
8 days, 64 hours.

**Course Fee**
- Full Fee: $4,000 (excluding GST)
- Nett Fee: (Singaporeans/PRs): $400 (excluding GST)

Fees are subject to changes by the training providers.
### WSQ Perform Engineering Simulation for the Marine & Offshore Industry

**Description**
The course focuses on applications in the marine and offshore industry. It is recommended for engineers who wish to perform various engineering analyses related to marine and offshore engineering using Finite Element Analysis (FEA) and Computational Fluid Dynamics (CFD) simulations. The standard stipulates how to analyze the dynamics of structures, analyze fatigue phenomena for both linear and non-linear static structural analyses, perform multi-body hydrodynamic analysis on all types of marine and offshore structures, and analyze fluid-structure interaction to understand the interfaces between fluid and structural domains for various marine and offshore applications.

**Module**
Perform Engineering Simulation for the Marine & Offshore Industry

**Statement of Attainment Awarded**
WSQ Perform Engineering Simulation for the Marine & Offshore Industry

**Target Audience**
- Working professionals with engineering background who wish to upgrade their Computer-aided Engineering (CAE) skills in marine & offshore related analysis
- Engineers/Technical Managers who need a refresher course on CAE skills in marine & offshore related analysis

**Pre-Requisites**
Engineering knowledge is required. Familiarity with computer (PC or workstation) and knowledge of Computer Aided Engineering (CAE) are useful.

**Participants must have completed the following course (or its equivalent):**
- Apply Engineering Simulation Fundamentals

**Participants should preferably have completed the following courses:**
- Perform Structural Simulation for Design Verification
- Perform CFD Simulation for Design Verification

**Course Duration**
8 days, 64 hours.

**Course Fee**
- Full Fee: $6,400 (excluding GST)
- Nett Fee: (Singaporeans/PRs): $640 (excluding GST)

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### WSQ Perform Engineering Simulation for the Industrial Equipment / Machinery Industry

**Description**
The course focuses on applications in the equipment and machinery industry. It is recommended for engineers who wish to perform engineering analyses related to industrial equipment and machineries. It stipulates how to analyze multi-body, rigid and flexible structural dynamics, thermal response of structures and components, fatigue phenomena and combustion simulations.

**Module**
Perform Engineering Simulation for the Industrial Equipment / Machinery Industry

**Statement of Attainment Awarded**
WSQ Perform Engineering Simulation for the Industrial Equipment / Machinery Industry

**Target Audience**
- Working professionals with engineering background who wish to upgrade their Computer-aided Engineering (CAE) skills in industrial equipment and machineries development
- Engineers/Technical Managers who need a refresher course on CAE skills in industrial equipment and machineries development

**Pre-Requisites**
Engineering knowledge is required. Familiarity with computer (PC or workstation) and knowledge of Computer Aided Engineering (CAE) are useful.

**Participants must have completed the following course (or its equivalent):**
- Apply Engineering Simulation Fundamentals

**Participants should preferably have completed the following courses:**
- Perform Structural Simulation for Design Verification
- Perform CFD Simulation for Design Verification

**Course Duration**
8 days, 64 hours.

**Course Fee**
- Full Fee: $6,400 (excluding GST)
- Nett Fee: (Singaporeans/PRs): $640 (excluding GST)

*Fees are subject to changes by the training providers.*
# CAD-IT CONSULTANTS (ASIA) PTE LTD

**Enquiries & Applications:**
Ms Jessie Chan / Miko Ngiu / Precilla Eurlco  
Website: [www.cadit.com.sg](http://www.cadit.com.sg)  
Tel: 6508 7575  
Email: training@cadit.com.sg

## WSQ Perform Engineering Simulation for the Medtech Industry

<table>
<thead>
<tr>
<th>Description</th>
<th>The course focuses on applications in the medical technology industry, is recommended for engineers who wish to perform engineering analyses related to Medtech products and processes. It stipulates how to analyze coupled physics, thermal response of structures and components, multispecies and multiphase flows and perform drop test analyses.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Module</td>
<td>Perform Engineering Simulation for the Medtech Industry</td>
</tr>
<tr>
<td>Statement of Attainment Awarded</td>
<td>WSQ Perform Engineering Simulation for the Medtech Industry</td>
</tr>
</tbody>
</table>
| Target Audience | • Working professionals with engineering background who wish to upgrade their Computer-aided Engineering (CAE) skills in medical products and processes development  
• Engineers/Technical Managers who need a refresher course on CAE skills in medical products and processes development |
| Pre-Requisites | Engineering knowledge is required. Familiarity with computer (PC or workstation) and knowledge of Computer Aided Engineering (CAE) are useful.  
Participants must have completed the following course (or its equivalent):  
• Apply Engineering Simulation Fundamentals  
Participants should preferably have completed the following courses:  
• Perform Structural Simulation for Design Verification  
• Perform CFD Simulation for Design Verification |
| Course Duration | 8 days, 64 hours. |
| Course Fee | Full Fee: $6,400 (excluding GST)  
Nett Fee: (Singaporeans/PRs): $640 (excluding GST) |

### Fees are subject to changes by the training providers.

## WSQ Perform Engineering Simulation for the Aerospace Industry

<table>
<thead>
<tr>
<th>Description</th>
<th>The course focuses on applications in the Aerospace industry, is recommended for engineers who wish to perform engineering analyses related to Aerospace products and processes. It stipulates how to perform advanced geometry preparation and meshing, analyze the dynamics of structures, perform turbulent flow analyses and analyze rotating machinery simulations.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Module</td>
<td>Perform Engineering Simulation for the Industrial Equipment / Machinery Industry</td>
</tr>
<tr>
<td>Statement of Attainment Awarded</td>
<td>WSQ Perform Engineering Simulation for the Industrial Equipment / Machinery Industry</td>
</tr>
</tbody>
</table>
| Target Audience | • Working professionals with engineering background who wish to upgrade their Computer-aided Engineering (CAE) skills in industrial equipment and machineries development  
• Engineers/Technical Managers who need a refresher course on CAE skills in industrial equipment and machineries development |
| Pre-Requisites | Engineering knowledge is required. Familiarity with computer (PC or workstation) and knowledge of Computer Aided Engineering (CAE) are useful.  
Participants must have completed the following course (or its equivalent):  
• Apply Engineering Simulation Fundamentals  
Participants should preferably have completed the following courses:  
• Perform Structural Simulation for Design Verification  
• Perform CFD Simulation for Design Verification |
| Course Duration | 8 days, 64 hours. |
| Course Fee | Full Fee: $6,400 (excluding GST)  
Nett Fee: (Singaporeans/PRs): $640 (excluding GST) |

### Fees are subject to changes by the training providers.
<table>
<thead>
<tr>
<th>Module</th>
<th>Perform Engineering Simulation for Defence &amp; Homeland Security</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description</strong></td>
<td>This module, focusing primarily on applications in Defence and Homeland Security, is recommended for engineers who wish to perform engineering analyses related to Defence and Homeland Security products and processes. It stipulates how to analyze basic explicit dynamics simulations, analyze advanced explicit dynamics simulations, perform highly nonlinear, transient dynamics analyses and perform turbulent flow analyses.</td>
</tr>
</tbody>
</table>
| **Target Audience** | • Working professionals with engineering background who wish to upgrade their Computer-aided Engineering (CAE) skills in defence & security devices development  
• Engineers/Technical Managers who need a refresher course on CAE skills in defence & security devices development |
| **Pre-Requisites** | Engineering knowledge is required. Familiarity with computer (PC or workstation) and knowledge of Computer Aided Engineering (CAE) are useful.  
Participants must have completed the following course (or its equivalent):  
• Apply Engineering Simulation Fundamentals |
| **Course Duration** | 8 days, 64 hours. |
| **Course Fee** |  
Full Fee: $6,400 (excluding GST)  
Nett Fee: (Singaporeans/PRs): $640 (excluding GST) |

<table>
<thead>
<tr>
<th>Module</th>
<th>Perform DFM Verification for PCB Designs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description</strong></td>
<td>This course is suitable for Electronics Engineers, New Product Introduction (NPI) Engineers and their managers, as well as Engineers involved in the design and verification stages of PCB manufacturing to learn about the importance of Design for Manufacturability (DFM) in the design, fabrication and assembly of circuit boards for reduced revision spins, reduced wastage and ultimately improve product life cycle time frames for PCB board manufacturing.</td>
</tr>
</tbody>
</table>
| **Target Audience** | • Working professionals with engineering background who wish to upgrade their Computer-aided Engineering (CAE) skills in PCB design and manufacturing  
• Engineers/Technical Managers who need a refresher course on CAE skills in PCB design and manufacturing |
| **Pre-Requisites** | Prior Electrical Engineering knowledge is required. Familiarity with computer (PC or workstation) and basic knowledge of Computer Aided Design (CAD) tools will be useful. Participants should preferably have basic knowledge of PCB designs and a good background on the downstream process in PCB manufacturing. |
| **Course Duration** | 3 days, 24 hours. |
| **Course Fee** |  
Full Fee: $2,400 (excluding GST)  
Nett Fee: (Singaporeans/PRs): $240 (excluding GST) |

Fees are subject to changes by the training providers.
## WSQ Perform Plastic Injection Molding Simulation – Fundamental

**Description**
This training course is intended for all involved in plastic injection molding tools – designers, simulation engineers, process engineers and managers, plastic part product designers, managers or engineers or technicians who need to validate the injection mold tool design and process using simulation.

The course focuses on the basic understanding of Plastic Injection Molding process needed to perform plastic material flow simulation and analysis. Trainees will learn how to step-by-step set up, simulate and analyse the plastic material flow inside the part and interpret the simulation results. They will also gain the knowledge of how to manage various process parameters involved and efficiently improve the quality during design stage itself using simulation.

**Module**
Perform Plastic Injection Molding Simulation – Fundamental

**Statement of Attainment Awarded**
WSQ Perform Plastic Injection Molding Simulation – Fundamental

**Target Audience**
- Working professionals with engineering background who wish to upgrade their Computer-aided Engineering (CAE) skills in plastic products design and mold design
- Engineers/Technical Managers who need a refresher course on plastic products design and mold design

**Pre-Requisites**
Engineering knowledge is required. Familiarity with computer (PC or workstation) and basic knowledge of Computer Aided Design (CAD) tools will be useful.

**Course Duration**
7 days, 56 hours.

**Course Fee**
- Full Fee: $5,600 (excluding GST)
- Nett Fee: (Singaporeans/PRs): $560 (excluding GST)

Fees are subject to changes by the training providers.

## WSQ Perform Plastic Injection Molding Simulation – Advanced

**Description**
This training course is intended for all involved in plastic injection molding tools – designers, simulation engineers, process engineers and managers, plastic part product designers, managers or engineers or technicians who already have the pre-requisite knowledge of plastic injection molding simulation and want to master advanced simulation techniques such as balanced flow analysis of family molds, multi-gating analysis, core-shift analysis, warpage analysis as well as packing & cooling optimisation.

**Module**
Perform Plastic Injection Molding Simulation – Advanced

**Statement of Attainment Awarded**
WSQ Perform Plastic Injection Molding Simulation – Advanced

**Target Audience**
- Working professionals with engineering background who wish to upgrade their Computer-aided Engineering (CAE) skills in plastic products design and mold design
- Engineers/Technical Managers who need a refresher course on plastic products design and mold design

**Pre-Requisites**
Engineering knowledge is required. Familiarity with computer (PC or workstation) and basic knowledge of Computer Aided Design (CAD) tools will be useful.

**Participants must have completed the following course (or its equivalent):**
- Perform Plastic Injection-Molding Simulation - Fundamentals

**Course Duration**
3 days, 24 hours.

**Course Fee**
- Full Fee: $2,400 (excluding GST)
- Nett Fee: (Singaporeans/PRs): $240 (excluding GST)

Fees are subject to changes by the training providers.
WSQ Advanced Design of Pneumatic Systems

Description
The course aims to provide participants with a wider knowledge of complex pneumatic and electro-pneumatic control systems as well as to develop ability to design, assemble and operate the controls. To enable the participant to read and assemble circuits with additional conditions.

Module
Advanced Design of Pneumatic Systems

Statement of Attainment Awarded
WSQ Advanced Design of Pneumatic Systems

Target Audience
Engineers, technicians and supervisors who are involved in the design of pneumatic control systems

Course Duration
32 hours

Course Fee
Full Fee: $800 (excluding GST)
Nett Fee: (Singaporeans/PRs): $80 (excluding GST)

Fees are subject to changes by the training providers.

WSQ Perform Basic Control for Mobile Hydraulic Systems

Description
The course aims to provide participants with the knowledge and skills in controlling mobile hydraulic equipment and systems and will be able to apply them to the workplace.

Module
Perform Basic Control for Mobile Hydraulic Systems

Statement of Attainment Awarded
WSQ Perform Basic Control for Mobile Hydraulic Systems

Target Audience
Engineers, technicians and supervisors who are involved in the design of mobile hydraulic control systems.

Course Duration
24 hours

Course Fee
Full Fee: $750 (excluding GST)
Nett Fee: (Singaporeans/PRs): $75 (excluding GST)

Fees are subject to changes by the training providers.

WSQ Perform Basic Control for Proportional Hydraulic Systems

Description
The course aims to provide participants with the knowledge and skills in controlling hydraulic equipment and systems with proportional control and will be able to apply them to the workplace.

Module
Perform Basic Control for Proportional Hydraulic Systems

Statement of Attainment Awarded
WSQ Perform Basic Control for Proportional Hydraulic Systems

Target Audience
Engineers, technicians and supervisors who are involved in the design of proportional hydraulic control systems.

Course Duration
16 hours

Course Fee
Full Fee: $500 (excluding GST)
Nett Fee: (Singaporeans/PRs): $50 (excluding GST)

Fees are subject to changes by the training providers.
## ADVANCED CERTIFICATE COURSES

**SETSCO SERVICES PTE LTD**

<table>
<thead>
<tr>
<th>Email</th>
<th>Tel</th>
<th>Name</th>
<th>Enquiries &amp; Applications:</th>
</tr>
</thead>
<tbody>
<tr>
<td><a href="mailto:andycheong@setsco.com">andycheong@setsco.com</a></td>
<td>6895 0626</td>
<td>Mr Andy Cheong Kok Fei</td>
<td>Mr See Wah Kiaw</td>
</tr>
<tr>
<td>Email: <a href="mailto:andycheong@setsco.com">andycheong@setsco.com</a></td>
<td>Tel: 6895 0633</td>
<td>Website: <a href="http://www.setsco.com">www.setsco.com</a></td>
<td></td>
</tr>
</tbody>
</table>

### WSQ Perform Protective Coating Inspection

**Description**
The course covers all the theoretical background related to organic Protective Coating Inspection. The course is also fully supported by hands-on practical sessions. It provides course participants with sufficient knowledge and expert guidance to use the best methods to solve or at least to cope with coating problems frequently encountered or likely to be confronted.

**Module**
Perform Protective Coating Inspection

**Statement of Attainment Awarded**
WSQ Perform Protective Coating Inspection

**Target Audience**
Plant Maintenance Engineers and Supervisors, Materials Engineers, Design, Manufacturing, Mechanical and Inspection Engineers, Quality Assurance/Control Personnel, Chemical Treatment Personnel and Protective Coating Personnel.

**Course Duration**
48 hours

**Course Fee**
- **Full Fee**: $2,500 (excluding GST)
- **Nett Fee**: (Singaporeans/PRs): $250 (excluding GST)

### WSQ Perform Phased Array Ultrasonic Testing

**Description**
The training is intended to provide participants with the knowledge and skill needed to conduct phased array ultrasonic testing of welds in accordance with industry standards, codes and specifications. Participants are subject to competency-based assessments at the end of the course.

**Module**
Perform Phased Array Ultrasonic Testing

**Statement of Attainment Awarded**
WSQ Perform Phased Array Ultrasonic Testing

**Target Audience**
NDT personnel, maintenance personnel, quality assurance / quality control inspectors, engineers, surveyors, technicians, trainees in the aerospace, metal fabricators, oil refinery, petrochemical, offshore, shipbuilding, ship-repairing and building construction industries.

**Course Duration**
86 hours

**Course Fee**
- **Full Fee**: $3,700 (excluding GST)
- **Nett Fee**: (Singaporeans/PRs): $370 (excluding GST)

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## DIPLOMA COURSES

**NANYANG POLYTECHNIC (NYP)**

<table>
<thead>
<tr>
<th>Email</th>
<th>Tel</th>
<th>Name</th>
<th>Enquiries &amp; Applications:</th>
</tr>
</thead>
<tbody>
<tr>
<td><a href="mailto:mke_kwek@nyp.edu.sg">mke_kwek@nyp.edu.sg</a></td>
<td>6550 0677</td>
<td>Mr Mike Kwek</td>
<td>Mr Nah Yeong Teck</td>
</tr>
<tr>
<td>Email: <a href="mailto:mke_kwek@nyp.edu.sg">mke_kwek@nyp.edu.sg</a></td>
<td>Tel: 6550 0677</td>
<td>Website: <a href="http://www.nyp.edu.sg">www.nyp.edu.sg</a></td>
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### WSQ Diploma in Precision Engineering (Master Craftsmen Skills)

**Description**
Launched by NYP with support from EDB, SPRING Singapore and WDA, the programme helps employees stay relevant by enhancing their technical capabilities and training them to be higher achievers. The course is designed to deepen and upgrade the skills and knowledge of participants in relevant precision engineering areas. Participants will complete 6 common core and sector core modules that will provide them with a strong foundation in applying productivity tools, managing productivity, engineering mathematics, Computer-Aided Design (CAD), mechanical fixtures design and project management.

Participants will then complete another 5 specialised elective modules that will enhance their expertise in the technology areas of advanced mould design and process, advanced CAM & CNC machining and equipment building and automation.

**Course/Modules**
- **Common Core**
  1. Manage Manufacturing Productivity Improvement
  2. Apply Productivity Improvement Tools
  3. Apply Mathematical Concepts in Engineering Solutions
  4. Apply Mechanise in Design Solutions
- **Sector Core**
  5. Apply Computer-Aided Design (CAD) Techniques
  6. Apply Mechanical Fixtures Design
- **Elective 1 [Advanced Mould Design & Process]**
  7. Participants will select one of the following Electives:
  8. Apply Advanced Mould Design
  9. Apply Advanced Mould Flow Simulation
  10. Apply Plastics Injection Moulding
  11. Apply Plastics Material Technology
- **Elective 2 [Advanced CAM & CNC Machining]**
  12. Manage Engineering Project (Mould Design & Process)
  13. Apply Computer-Aided Manufacturing (CAM) Techniques
  14. Apply Advanced CNC Machining
  15. Apply Advanced Toolroom Machining
  16. Apply Process Optimisation & Cutting Technologies
  17. Manage Engineering Project (CAM & CNC Machining)
- **Elective 3 [Equipment Building and Automation]**
  18. Apply Solid Modeling & Drafting for Machine Parts
  19. Apply Mechanical Components & Peripherals in Automated Equipment
  20. Apply Automatic Control for Machines
  21. Apply Project Management in Equipment Building
  22. Manage Engineering Project (Equipment Building & Automation)

**Course Duration**
600 hours, 1 full day (8 hours) and 1 evening (3 hours) session per week.

**Course Fee**
- **Full Fee**: $16,700 (excluding GST) / $17,869 (including GST)
- **Nett Fee** (Singaporeans/PRs): $250 (excluding GST)

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**Fees are subject to changes by the training providers.**
**WSQ Diploma in Machinery and Systems**

**Description**
This program is designed for existing engineering personnel in the machinery and systems (M & S) sector who want to build on their experience. It is also designed for engineering personnel who are not in the M & S sector but with engineering knowledge of automation equipment and are considering a switch from other engineering work to M & S sector.

This program takes the participants through different modules that equip them with mechanical design, electrical design, control programming, machine assembly and troubleshooting, and RFID technology.

This program targets at equipment & maintenance technicians and engineers in the machinery and systems sector of the precision engineering industry. It is also applicable for personnel handling and maintaining automated machinery.

**Courses/Modules**
- **Common Core**
  1. Manage Quality Systems
  2. Manage Teams in the Workplace
  3. Manage Workplace Safety and Health (WSH) Systems
  4. Manage Continuous Improvements
- **Electives**
  5. Apply Radio Frequency Identification (RFID) Technology
  6. Design Mechanism Unit of Machine
  7. Assembly of Mechanical Machines
  8. Software Development for Automated Machines
  9. Design Tooling, Jigs and Fixtures for Manufacture
  10. Design and Build Industrial Machine Electrical System

**Qualification Awarded**
WSQ Diploma in Machinery and Systems

**Target Audience**
The course is targeted at participants with at least a NITEC qualification from the disciplines in Science and Technology segments, examples: Precision Engineering, Mechanical Engineering, Electrical Engineering, Electronics Engineering, and Mechatronics Engineering.

Matured adults without formal qualifications but who are presently working in the technology and engineering industry can also be considered for this course.

**Course Duration**
1.5-Year Part Time, 600 hours.

**Course Fee**
- Full Fee: $12,000 (excluding GST)
- Nett Fee (Singaporeans/PRs): $3,600 (excluding GST)

Fees are subject to changes by the training providers.

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**WSQ Diploma in Mechatronics and Robotics**

**Description**
This program is designed for existing engineering personnel in the mechatronics and robotics area who want to build on their experience. It is also designed for engineering personnel who are not in the mechatronics and robotics area but with engineering knowledge of automation equipment and considering a switch from other engineering work to this area.

This program takes the participants through multi-disciplinary modules that equip them with skills to confidently handle highly automated manufacturing equipment.

This program targets at technicians and engineers in the high-tech manufacturing industry. It is also applicable for personnel handling and maintaining automated machinery.

**Courses/Modules**
- **Common Core**
  1. Manage Quality Systems
  2. Manage Teams in the Workplace
  3. Manage Workplace Safety and Health (WSH) Systems
  4. Manage Continuous Improvements
- **Electives**
  5. Apply Computer Integrated Manufacturing (CIM) System
  6. Apply Robotics Fundamentals
  7. Apply Sensors and Actuators in Automation
  8. Design and Implement a Robot Automated Machine's Electrical System
  9. Develop Software Programme for Machine Vision
  10. Maintain and Service Robots in Manufacturing

**Qualification Awarded**
WSQ Diploma in Mechatronics and Robotics

**Target Audience**
The course is targeted at participants with at least a NITEC qualification from the disciplines in Science and Technology segments, examples: Precision Engineering, Mechanical Engineering, Electrical Engineering, Electronics Engineering, and Mechatronics Engineering.

Matured adults without formal qualifications but who are presently working in the technology and engineering industry can also be considered for this course.

**Course Duration**
1.5-Year Part Time, 600 hours.

**Course Fee**
- Full Fee: $12,000 (excluding GST)
- Nett Fee (Singaporeans/PRs): $3,600 (excluding GST)

Fees are subject to changes by the training providers.
**WSQ Specialist Diploma in Precision Engineering (Master Craftsman Skills)**

**Description**
The course is designed as an advancement pathway for graduates of the WSQ Diploma in Precision Engineering (Master Craftsman Skills) to further deepen and broaden their technical skills. Apart from technical knowledge, participants will also acquire pedagogical skills and leadership skills to be able to lead, train and manage junior craftsmen.

**Course/Modules**
1. Apply Advanced Metrology & QA
2. Apply Advanced Materials Technology
3. Apply Advanced Manufacturing Technology & Process
4. Apply Pedagogy Methodology for the Workplace Part 1
5. Apply Pedagogy Methodology for the Workplace Part 2
6. Manage Shopfloor Monitoring & Process

**Qualification Awarded**
WSQ Specialist Diploma in Precision Engineering (Master Craftsman Skills)

**Target Audience**
Professionals, Managers, Executives and Technicians.

**Course Duration**
300 hours, 1 full day (8 hours) and 1 evening (3 hours) session per week.

**Course Fee**
Full Fee: $10,500 (excluding GST) / $11,235 (including GST)
Nett Fee (Singaporeans/PRs): $3,150 (excluding GST) / $3,370 (including GST)

Fees are subject to changes by the training providers.

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**WSQ Specialist Diploma in Precision Engineering (Additive Manufacturing)**

**Description**
The Specialist Diploma in Precision Engineering (Additive Manufacturing) is designed to support the current and emerging needs of Precision Engineering and Manufacturing industry to innovate and stay competitive by leveraging on new trend towards Additive Manufacturing, also known as 3D Printing. By combining the knowledge of latest technology and know-how in Precision Engineering and Additive Manufacturing, participants will be able to apply the new skill sets and knowledge in Additive Manufacturing in areas including aerospace components, medical devices, consumer products, tooling, electronics and much more.

The specialist programme provides comprehensive application training in Additive Manufacturing technologies, design optimisation and metrology.

**Course/Modules**
1. Apply Additive Manufacturing Technology
2. Manage Advanced Additive Manufacturing Technology & Application
3. Apply Advanced Metrology & Quality Assurance
4. Apply Computer Aided Design (CAD) Techniques for Additive Manufacturing
5. Apply Advanced Design For Additive Manufacturing
6. Manage Innovative Product Development Project using Additive Manufacturing

**Qualification Awarded**
WSQ Diploma in Precision Engineering (Additive Manufacturing)

**Target Audience**
Professionals, Managers, Executives and Technicians wishing to update their knowledge and skills in the emerging area of Additive Manufacturing.

**Course Duration**
240 hours, 3 evening sessions (3 hours/session) per week.

**Course Fee**
Full Fee: $8,880 (excluding GST) / $9,501.60 (including GST)
Nett Fee (Singaporeans/PRs): $2,664 (excluding GST) / $2,850.48 (including GST)

Fees are subject to changes by the training providers.
SINGAPORE INSTITUTE OF MANUFACTURING TECHNOLOGY (SIMTech)

Enquiries & Applications:
Course Enquiries:
Dr. Lim Gnan Cher
Tel: 6793 8489
Email: gclim@SIMTech.a-star.edu.sg

Course Application:
http://kto.SIMTech.a-star.edu.sg

WSQ Specialist Diploma in Precision Engineering

Description
The programme aims to provide hands-on training to equip future PE professionals in cutting-edge precision manufacturing, machining, advanced joining techniques, surface finishing/coating and laser processing technologies.

The programme will be conducted through a series of lectures and lab demonstration in selected industrial applications. It aims to equip workers in the PE industry towards higher-value manufacturing activities, as companies move their labour intensive activities out of Singapore.

Course/Modules* Select any 5 modules:
1. Laser Machine Technology
2. Apply Injection Moulding Tool Design
3. High Speed Machining and Cutting Tools
4. Employ Advanced Metal Forming and Casting Technologies
5. Apply Surface and Coating Technologies
6. Apply Advanced Joining Technologies

*Note: Candidate can register for individual module(s).

Qualification
Awarded
WSQ Specialist Diploma in Precision Engineering

Target Audience
Personnel working in Precision Engineering, Electronics, Aerospace and Automotive and other relevant industrial sectors.

Course Duration
1-Year Part Time, up to two evenings per week from 6.30pm to 9.30pm.

Course Fee
Full Fee: $2,400 (excluding Funding & GST)
Nett Fee: (Singaporeans/PRs): $720 per module (excluding GST)

Additional Enhanced SME Funding of 90% of course fee available for application.

Fees are subject to changes by the training providers.

SINGAPORE POLYTECHNIC (SP)

Enquiries & Applications:
Professional & Adult Continuing Education (PACE) Academy
Tel: 6772 1288
Email: pace@sp.edu.sg
Website: pace.sp.edu.sg

WSQ Specialist Diploma in Medical Technology Manufacturing

Description
This programme is designed to provide participants with knowledge and skills in Medical Technology (MedTech) regulatory requirements, design, precision machining, injection moulding, cleanroom operations and process control and operations for the MedTech industry.

This program targets at engineers, assistant engineers and senior technicians who are working in the MedTech industry. It is also targeted at those who are considering a career switch to the MedTech industry.

Course/Modules
1. Manage Regulatory Requirements for Medical Devices
2. Design of Biomedical Devices
3. Control Precision Machining for Medical Technology
4. Apply Injection Moulding Technology for Medical Devices
5. Apply Contamination Control in Cleanroom Operations
6. Control and Operate Medical Technology Manufacturing Process

Qualification
Awarded
WSQ Specialist Diploma in Medical Technology Manufacturing

Target Audience
This course is targeted at Engineers, Assistant Engineers, Senior Technicians who are working in the Medical Technology industry, and participants who are considering a career switch to the Medical Technology industry.

Pre-Requisites
Engineering knowledge is required. Familiarity with computer (PC or workstation) and basic knowledge of Computer Aided Engineering (CAE) are useful.

Course Duration
1-Year Part Time, 267 hours.

Course Fee
Full Fee: $6,000 (excluding GST)
Nett Fee: (Singaporeans/PRs): $1,800 (excluding GST)

Fees are subject to changes by the training providers.
Description
The objective of the programme is to inculcate the core competencies including fundamental knowledge and skills in precision engineering design and processes necessary for managers and engineers in precision engineering related manufacturing industries. Participants will gain basic knowledge, techniques and skills in precision engineering design and various processes that are used in the manufacturing industry. They have to complete the 2 core modules and any 3 out of the 6 electives offered to complete the Graduate Diploma qualification.

The programme is designed for Engineering Managers, Product Designers, Quality Control Engineers and Inspectors, Procurement Personnel, Researchers and Technical staff in precision mechanics, optics components and optical instrumentation from the Precision Engineering, Semiconductor, Electronics industries.

Course/Modules

<table>
<thead>
<tr>
<th>Common Core</th>
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<tbody>
<tr>
<td>1. Geometric Dimensioning &amp; Tolerancing</td>
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<td>2. Implement Optical Metrology</td>
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<thead>
<tr>
<th>Electives (select any 3)</th>
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<tr>
<td>3. Tolerance Stackup and Analysis in Mechanical Design</td>
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<td>4. 3D Printing for Rapid Product Development</td>
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<td>5. Vibration Design and Control for Precision Engineering</td>
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<td>6. Design for Manufacture and Assembly</td>
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<tr>
<td>7. Manage High Vacuum Technology</td>
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<tr>
<td>8. Establish Lean Six Sigma Methodology</td>
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<td>9. Apply Statistics for Lean Six Sigma</td>
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Qualification/ Statements of Attainments Awarded
WSQ Graduate Diploma in Design and Processes

Target Audience
Managers and Engineers in manufacturing industries related to Precision Engineering.

Course Duration
28 – 40 hours per module

Course Fee
Full Fee: approx. $7,939 (excluding GST), 2 core + 3 electives
Nett Fee (Singaporeans/PRs): approx. $2,381.70 (excluding GST)

Fees are subject to changes by the training providers.

WSQ Geometric Dimensioning and Tolerancing

Description
Participants will be able to learn the basic principles and building blocks of GD&T, appreciate the merits of GD&T and how it complements conventional tolerancing methods. They will also learn to be able to read, specify and interpret GD&T language and also to apply GD&T for technical and economic competitive advantages.

Module
Geometric Dimensioning and Tolerancing

Target Audience
Personnel who need to read engineering drawings. Relevant occupations include:

- Engineering Managers
- Product Designers
- Process and Tooling Engineers and Technical Personnel
- Quality Control Inspectors
- Procurement Personnel

Course Duration
31.5 hours

Course Fee
Full Fee: $1,605 (excluding GST)
Nett Fee (Singaporeans/PRs): $481.50 (excluding GST)

Fees are subject to changes by the training providers.
### WSQ Implement Optical Metrology

**Description**
The course will focus on reinforcing the measurement concepts practiced in optics industries through case studies. It will also cover latest developments and challenges (both at industry and research and developmental stages) in optical measurements. It is targeted at all personnel needing to apply and learn measurement methods and measuring Instruments in engineering ranging from manufacturing, inspection, to procurement. Through the course it may assist them to better manage their project scope, correct choice of instruments, quality problem solving and cost.

**Module**
Implement Optical Metrology

**Statements of Attainment Awarded**
WSQ Implement Optical Metrology

**Target Audience**
- Product Designers, Engineers working in optics industries
- Engineers and Managers in mechanical and production area
- R&D Engineers and staff working in Industries or NDT
- Quality Control Engineers and Inspectors

**Course Duration**
28 hours

**Course Fee**
- Full Fee: $1,519 (excluding GST)
- Nett Fee (Singaporeans/PRs): $455.70 (excluding GST)

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### WSQ Tolerance Stackup and Analysis in Mechanical Design

**Description**
Participants will be able to learn the definitions and principles of tolerancing and fit functions, the various tolerance stack analysis tools and use them to perform tolerance stack analysis on part/assembly and how to apply the various tolerance analysis tools and techniques to determine the intended functional relationships with or without GD&T specifications.

**Module**
Tolerance Stackup and Analysis in Mechanical Design

**Statements of Attainment Awarded**
WSQ Tolerance Stackup and Analysis in Mechanical Design

**Target Audience**
- Engineering Managers
- Product Designers
- Process and Tooling Engineers and Technical Personnel
- Quality Control Engineers and Inspectors
- Procurement Personnel

**Course Duration**
35 hours

**Course Fee**
- Full Fee: $1,691 (excluding GST)
- Nett Fee (Singaporeans/PRs): $507.30 (excluding GST)

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### 3D Printing for Rapid Product Development

**Description**
Participants will understand the motivation behind 3D Printing, Rapid Prototyping (RP) or Additive Manufacturing (AM) and to familiarize with the various RP techniques so as to compare their strengths and limitations. They will understand the products, processes, pros and cons, and applications of each PPM technique. Participants will also be exposed to the industrial case studies in fields such as aerospace, automotive, consumer products, arts, architecture and biomedical engineering.

**Module**
WSQ 3D Printing for Rapid Product Development

**Statements of Attainments Awarded**
WSQ 3D Printing for Rapid Product Development

**Target Audience**
This 3D Printing course is suitable for personnel who need to build prototypes for design and manufacturing. Relevant occupations include:
- Engineering Managers
- Product Designers
- Academics and Researchers

**Course Duration**
28 hours

**Course Fee**
- Full Fee: $1,519 (excluding GST)
- Nett Fee (Singaporeans/PRs): $455.70 (excluding GST)
GRADUATE DIPLOMA COURSES

NANYANG TECHNOLOGICAL UNIVERSITY - CENTRE FOR CONTINUING EDUCATION (NTU - CCE)

WSQ Vibration Design and Control for Precision Engineering

Description
Participants will learn the basic definitions and principles of engineering mechanics and to be able to model mechanical systems and write equations of motions. They will also learn to understand the solutions of second order differential equations and complex numbers and complex exponentials.

Module
Vibration Design and Control for Precision Engineering

Statements of Attainment Awarded
WSQ Vibration Design and Control for Precision Engineering

Target Audience
• Engineering Managers
• Product Designers
• Process and Tooling Engineers and Technical Personnel
• Quality Control Engineers, Technical Officers and Inspectors
• Product Equipment Related Personnel
• Procurement Personnel
• Research Engineers and Scientific Officers

Course Duration
24.5 hours

Course Fee
Full Fee: $1,412 (excluding GST)
Nett Fee (Singaporeans/PRs): $423.60 (excluding GST)

WSQ Design for Manufacture and Assembly

Description
The objective of the course is to teach the principles and techniques to design for ease of assembly, designed for technical personnel in design, manufacturing, process and quality control. After the course, participants can appreciate the underlying principles and rules for manufacturing a high quality, cost-effective product. This course relates to all technical personnel in design, manufacturing, process and quality control department.

Module
Design for Manufacture and Assembly

Statements of Attainment Awarded
WSQ Design for Manufacture and Assembly

Target Audience
• Manufacturing engineers
• Product designers
• Quality control inspectors
• Process engineers
• Materials procurement executives

Course Duration
28 hours

Course Fee
Full Fee: $1,519 (excluding GST)
Nett Fee (Singaporeans/PRs): $455.70 (excluding GST)

WSQ Manage High Vacuum Technology

Description
This course is designed to familiarise participants with the essential understanding of how to design, operate and maintain vacuum systems. It is targeted at all personnel needing to design, operate and maintain vacuum systems. Through the course, it would assist them to better manage vacuum systems resulting in improved performance, quality and cost.

Module
Manage High Vacuum Technology

Statements of Attainments Awarded
WSQ Manage High Vacuum Technology

Target Audience
This course is suitable for those who are involved in the design, operation and maintenance of vacuum systems including the following professionals:
• Engineering Manager
• Production Engineer
• Maintenance Engineer
• Process Engineer

Course Duration
28 hours

Course Fee
Full Fee: $1,519 (excluding GST)
Nett Fee (Singaporeans/PRs): $455.70 (excluding GST)

Fees are subject to changes by the training providers.

Enquiries & Applications:
Tel: 6790 4212
Fax: 6774 2911
Email: cce@ntu.edu.sg
Website: http://www.ntu.edu.sg/cce
WSQ Establish Lean Six Sigma Methodology

Description
This course will focus Lean Six Sigma Practitioners on building measurement and analytical tools, enabling them with more refined and sophisticated use of data when charts, graphs and “descriptive” data methods fall short. Participants will learn to develop effective sampling plans and procedures according to analysis methods being applied, and as well as to identify and formulate critical questions or hypotheses to be investigated through statistical analysis and experimentations.

Module
Establish Lean Six Sigma Methodology

Statements of Attainment Awarded
WSQ Establish Lean Six Sigma Methodology

Target Audience
Personnel who are involved in process improvement activities. Relevant occupations include:

- Engineering Manager
- Production Engineer or Manager
- Process Engineers
- Industrial Engineers
- Maintenance Engineers
- Supply Chain Managers

Course Duration
31.5 hours

Course Fee
Full Fee: $1,605 (excluding GST)
Nett Fee (Singaporeans/PRs): $481.50 (excluding GST)

Fees are subject to changes by the training providers.

WSQ Apply Statistics for Lean Six Sigma

Description
This course will focus Lean Six Sigma Practitioners on building measurement and analytical tools, enabling them with more refined and sophisticated use of data when charts, graphs and “descriptive” data methods fall short. Participants will learn to develop effective sampling plans and procedures according to analysis methods being applied, and as well as to identify and formulate critical questions or hypotheses to be investigated through statistical analysis and experimentations.

Module
Apply Statistics for Lean Six Sigma

Statements of Attainment Awarded
WSQ Apply Statistics for Lean Six Sigma

Target Audience
Personnel who are involved in process improvement activities. Relevant occupations include:

- Engineering Manager
- Production Engineer or Manager
- Process Engineers
- Industrial Engineers
- Maintenance Engineers
- Supply Chain Managers

Course Duration
24.5 hours

Course Fee
Full Fee: $1,412 (excluding GST)
Nett Fee (Singaporeans/PRs): $423.60 (excluding GST)

Fees are subject to changes by the training providers.
### WSQ Graduate Diploma in Precision Measurement and Characterisation

**Description**
The objective of the course is to provide the fundamental knowledge and hands-on training in precision measurement and metrology required for managers and engineers in precision engineering related manufacturing industries. The course is delivered by both local and international scientists from NIST (USA) with excellent track record in precision measurement. Participants will gain basic knowledge, techniques and hands-on skills in optics & laser, precision dimensional measurements, metrology, precision instruments, data analysis, material testing & characterisation and measurement standards. Besides these basic measurement technologies, participants will also acquire advanced knowledge and technology trends on precision measurements for precision engineering.

**Course/Modules***

1. Geometric Dimensioning & Tolerancing
2. Engineering Optics and Optical Measurements
3. Dimensional Measurements and Metrology
4. Industrial Vision Inspection and Measurements
5. Materials Characterisation

*Note: Candidate can register for individual module(s).

**Qualification Awarded**
WSQ Graduate Diploma in Precision Measurement and Characterisation

**Target Audience**
Personnel working in Aerospace, Automotive, Biomedical sectors, Electronics and Precision Engineering Semiconductor.

**Course Duration**
1-Year Part Time, two evenings per week from 6.30pm to 9.30pm.

**Course Fee**
- Full Fee: $3,000 per module (excluding Funding & GST)
- Net Fee: (Singaporeans/PRs): $900 per module (excluding GST)

Additional Enhanced SME Funding of 90% of course fee available for application.

*Fees are subject to changes by the training providers.*

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### WSQ Graduate Diploma in Mechatronics

**Description**
The training programme is designed to equip the participants with the capabilities of applying multi-disciplinary and integrated approaches to design and develop high value-added industrial equipment and products such as precision machine tools, semi conductor equipment, and measurement and optical instruments.

This programme targets at the industrial engineers, supervisors and managers, researchers and technical staff in the precision engineering, aerospace, optics and semiconductor industries.

**Course/Modules***

1. Design Precision Machines
2. Enhance Control Performance of Precision Machines
3. Design and Analyse for Machine Vibration
4. Apply Industrial Robots and Automation
5. Geometric Dimensioning & Tolerancing

*Note: Candidate can register for individual module(s).

**Qualification Awarded**
WSQ Graduate Diploma in Mechatronics

**Target Audience**
Personnel working in Aerospace, Optics, Semiconductor industries, and Precision Engineering.

**Course Duration**
1-Year Part Time, two evenings per week from 6.30pm to 9.30pm.

**Course Fee**
- Full Fee: $3,000 per module (excluding Funding & GST)
- Net Fee: (Singaporeans/PRs): $900 per module (excluding GST)

Additional Enhanced SME Funding of 90% of course fee available for application.

*Fees are subject to changes by the training providers.*
WSQ Graduate Diploma in Medical Technology Manufacturing

Description
The programme is designed to provide industry engineers, managers and directors with dedicated knowledge and skills in Medical Technology (MedTech) regulatory requirements, product design and innovation, manufacturing processes and validation, quality control systems as well as manufacturing management systems.

Course/Modules*
1. MedTech Regulatory Requirements
3. MedTech Manufacturing Processes
4. MedTech Manufacturing and Supply Chain Management
5. MedTech Device Design Innovation & Development

*Note: Candidate can register for individual module(s).

Qualification Awarded
WSQ Graduate Diploma in Medical Technology Manufacturing

Target Audience
Personnel working in MedTech industry.

Course Duration
1-Year Part Time, two evenings per week from 6.30pm to 9.30pm.

Course Fee
Full Fee: $3,000 per module (excluding Funding & GST)
Nett Fee: (Singaporeans/PRs): $900 per module (excluding GST)

Additional Enhanced SME Funding of 90% of course fee available for application.

Fees are subject to changes by the training providers.

WSQ Graduate Diploma in Manufacturing Operations Management (MOM)

Description
The programme aims to equip participants with the knowledge and skill sets required to perform their tasks effectively in the area of Manufacturing Operations Management. Specifically, it will enhance their functional knowledge of manufacturing operations management, provides the knowledge and skills for them to identify opportunities for improving the efficiency across the processes of their organization’s supply chain, streamlining the production operations, maximizing customer satisfaction by meeting delivery deadline, increasing profitability by optimizing their organization’s inventory investment and enhancing their credibility among peers, employers, and customers.

This programme is relevant for Production Supervisors, Industrial Engineering Engineer, Production Engineer, Planners, Schedulers, Production Managers, Production Control Managers, and other professionals involved in Production and inventory management, Shop floor operations management, Supply chain management, Procurement, and Materials management etc. from the Precision Engineering, Electronics, Aerospace and Automotive sectors.

Course/Modules*
1. Enterprise Resource Planning (ERP)
2. Operations Analysis
3. Manage Manufacturing Execution System (MES)
4. Advanced Planning & Scheduling (APS)
5. Inventory Management

*Note: Candidate can register for individual module(s).

Qualification Awarded
WSQ Graduate Diploma in Manufacturing Operations Management (MOM)

Target Audience
Personnel working in all industry sectors.

Course Duration
1-Year Part Time, two evenings per week from 6.30pm to 9.30pm.

Course Fee
Full Fee: $3,000 per module (excluding Funding & GST)
Nett Fee: (Singaporeans/PRs): $900 per module (excluding GST)

Additional Enhanced SME Funding of 90% of course fee available for application.

Fees are subject to changes by the training providers.
## WSQ Operations Management Innovation (OMNI) Programme

**Description**
The programme’s objective is to train key personnel of companies to be technology innovators to achieve manufacturing excellence. This is accomplished by promoting the use of operations management techniques and technologies that support a company’s strategy. This will ensure that operations improvement are both effective (align to company’s strategy) and efficient (achieve productivity gains).

The programme offers a proven Operations Management Innovation Methodology (OmniMethodology™) based on R&D, proven through highly successful applications in various sectors of the manufacturing industry. It consists of two parts: classroom training and mentorship. The classroom training focuses on transferring knowledge in operations management and use of this methodology. The mentorship reinforces the classroom learning by applying the said methodology in the student’s company. At this on-site training, the participant will identify operations improvement areas, generate suitable initiatives and develop implementation action plan that are based on productivity improvements, mentored by SIMTech’s trainers.

**Course/Modules**
1. Understand Operations Improvement Fundamentals
2. Improve Operations Action Plan using OmniMethodology
3. Implement Action Plan using OmniMethodology

**Qualification Awarded**
Statement of Attainment (SOA) will be awarded for each successfully completed module.

Participants may top up with 2 other modules from the WSQ Graduate Diploma in Manufacturing Operations Management (MOM) to be awarded a full qualification in MOM.

**Target Audience**
Personnel working in all industry sectors.

**Course Duration**
- 3-month part-time
- Classroom training consists of 10 half-day sessions, conducted over a 4 to 5-week period
- 3.5 months mentorship consisting of both scheduled and ad-hoc supervised sessions at company and SIMTech
- All sessions are held during working hours

**Course Fee**
- Full Fee: $18,000 per module (excluding Funding & GST)
- Nett Fee: (Singaporeans/PRs): $5,400 per module (excluding GST)

Additional Enhanced SME Funding of 90% of course fee available for application. Fees are subject to changes by the training providers.

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## WSQ Graduate Diploma in Metal Manufacturing Processes

**Description**
The programme aims to train the PMETs from precision engineering metal manufacturing industry with advanced skills and competency on metal forming, machining, welding, heat treatment processing, surface cleaning and protection and material selection for metal product design.

**Course/Modules**
- Select 5 core modules or any 4 core modules + 1 elective module

**Core modules:**
1. Evaluate Advanced Metal Machining Techniques
2. Perform Precision Metal Casting
3. Review Heat Treatment Process for Metals
4. Perform Integrated Forming Process Technology for Metals
5. Perform Advanced Metal Welding

**Elective modules:**
6. Review Advanced Heat Treatment Processes
7. Implement Fundamentals of Corrosion and Corrosion Prevention
8. Improve Machining Productivity through Dynamics Analysis and Simulation

*Note: Candidate can register for individual module(s).*

**Qualification Awarded**
WSQ Graduate Diploma in Metal Manufacturing Processes

**Target Audience**
Personnel working in Aerospace, Automotive, Electronics, Marine, Oil and gas, Precision Engineering Metal and other relevant industrial sectors.

**Course Duration**
1-Year Part Time, two evenings per week from 6.30pm to 9.30pm.

**Course Fee**
- Module 1~7:
  - Full Fee: $3,000 per module (excluding GST)
  - Nett Fee: (Singaporeans/PRs): $900 per module (excluding GST)
- Module 8:
  - Full Fee: $4,500 per module (excluding GST)
  - Nett Fee: (Singaporeans/PRs): $1,350 per module (excluding GST)

Additional Enhanced SME Funding of 90% of course fee available for application. Fees are subject to changes by the training providers.
**WSQ Graduate Diploma in Polymer Manufacturing Process**

**Description**
The programme aims to train the PMETs from precision engineering polymer manufacturing industry with knowledge and advanced skills and competency on material selection of polymer and polymer composite according to product requirements, advanced polymer processing technologies, polymer joining and evaluation, and polymer surface cleaning, functionisation and protection.

**Course/Modules**
Select 5 core modules Or any 4 core modules + 1 elective module

**Core modules:**
1. Review Fundamentals of Polymer and Polymer Composites
2. Perform Advanced Polymer and Polymer Composites Processing
3. Review Adhesives and Joining of Polymer
4. Perform Polymer Surface Modification and Coatings
5. Perform Materials Characterization

**Elective modules:**
6. Engineering Optics and Optical Measurements
7. Apply Advanced Coating Technologies for Corrosion Prevention

*Note: Candidate can register for individual module(s).*

**Qualification Awarded**
WSQ Graduate Diploma in Polymer Manufacturing Process

**Target Audience**
Personnel working in polymer-based manufacturing processes and product design.

**Course Duration**
1 Year Part Time, two evenings per week from 6.30pm to 9.30pm.

**Course Fee**
- Full Fee: $3,000 per module (excluding GST)
- Nett Fee: (Singaporeans/PRs): $900 per module (excluding GST)

Additional Enhanced SME Funding of 90% of course fee available for application.

Fees are subject to changes by the training providers.

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**WSQ Graduate Diploma in Advanced Welding Technologies**

**Description**
This course is specially designed to train participants in the various aspects of welding technologies and build up the competencies required to implement the technologies in various industrial applications. These include welding processes, weld design, weldability testing methods, process automation, distortion control, selection of materials and welding processing parameters. This course would also benefit engineers who wish to refresh their fundamentals and stay up-to-date with the latest developments in welding technology. The knowledge gained during this course benefit both the participants, who stand to upgrade their individual expertise, and their companies that have the opportunity to improve their competitiveness.

**Course/Modules**
1. Design Arc Welding
2. Implement Laser Beam Welding
3. Review Welding Operation & Quality Control
4. Adopt Friction Stir Welding and Diffusion Bonding
5. Evaluate Advanced Brazing

*Note: Candidate can register for individual module(s).*

**Qualification Awarded**
WSQ Graduate Diploma in Advanced Welding Technologies

**Target Audience**
Personnel working in Aerospace, Automotive, Electronics sectors, Marine, Oil and gas and Precision Engineering.

**Course Duration**
1 Year Part Time, two evenings from 6.30pm to 9.30pm.

**Course Fee**
- Full Fee: $3,000 per module (excluding GST)
- Nett Fee: (Singaporeans/PRs): $900 per module (excluding GST)

Additional Enhanced SME Funding of 90% of course fee available for application.

Fees are subject to changes by the training providers.
### WSQ Programme in Strategic Technology & Operation Roadmapping (STORM)

**Description**
The programme aims to train PMETs with skills and competency in Technology and Operation Roadmapping methodology and its subsequent implementation in their respective participating companies.

<table>
<thead>
<tr>
<th>Modules</th>
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</thead>
<tbody>
<tr>
<td>1. Review Processes for Strategic Technology &amp; Operation Roadmapping</td>
<td></td>
</tr>
<tr>
<td>2. Implement Strategic Technology &amp; Operation Roadmapping</td>
<td></td>
</tr>
</tbody>
</table>

**Statement of Attainments Awarded**
1. WSQ Review Processes for Strategic Technology & Operation Roadmapping
2. WSQ Implement Strategic Technology & Operation Roadmapping

**Target Audience**
Personnel working in all industry sectors.

**Course Duration**
45 hours per module

**Course Fee**
- Full Fee: $4,000 per module (excluding Funding & GST)
- Nett Fee: (Singaporeans/PRs): $1,200 per module (excluding GST)

*Additional Enhanced SME Funding of 90% of course fee available for application.*

Fees are subject to changes by the training providers.

### WSQ Programme in Carbon Management

**Description**
The programme aims to train the participants to conduct product carbon footprint (CFP) assessment based on ISO/TS 14067, hand-held participants to conduct CFP assessment on their own products, and guide participants to develop a plan for environmental and resource efficiency improvement based on the CFP assessment results.

**Modules**
1. Apply Carbon Footprint Assessment Methodology
2. Conduct Carbon Footprint Assessment
3. Develop Carbon Footprint Reduction Implementation Plan

*Candidate can register for individual module(s).*

**Statement of Attainments Awarded**
1. WSQ Apply Carbon Footprint Assessment Methodology
2. WSQ Conduct Carbon Footprint Assessment
3. WSQ Develop Carbon Footprint Reduction Implementation Plan

**Target Audience**
Personnel working in all industry sectors.

**Course Duration**
- Module 1: 40 hours
- Module 2 ~ 3: 39 hours per module

**Course Fee**
- Full Fee: $4,000 per module (excluding Funding & GST)
- Nett Fee: (Singaporeans/PRs): $1,200 per module (excluding GST)

*Additional Enhanced SME Funding of 90% of course fee available for application.*

Fees are subject to changes by the training providers.
**WSQ Apply Integrated Carbon-Footprint Assessment Methodology**

**Description**
The programme aims to provide practical guidance to perform product carbon footprint quantification. This is a consultancy and mentorship-based training module where the participants acquire knowledge on carbon footprint standards, learn practical assessment tools and techniques, and perform product carbon footprint quantification based on actual production environment.

**Modules**
Apply Integrated Carbon-Footprint Assessment Methodology

**Statement of Attainments Awarded**
WSQ Apply Integrated Carbon-Footprint Assessment Methodology

**Target Audience**
Personnel working in all industry sectors.

**Course Duration**
40 hours

**Course Fee**
- Full Fee: $4,000 (excluding Funding & GST)
- Nett Fee: (Singaporeans/PRs): $1,200 (excluding GST)

Additional Enhanced SME Funding of 90% of course fee available for application.

Fees are subject to changes by the training providers.

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**WSQ Programme in Corrosion Protection**

**Description**
The programme covers the fundamentals of corrosion / erosion prevention technology that are necessary for any person dealing with corrosion-related issues in the industry. It is designed to equip participants with background knowledge of the basics of corrosion and its timely evaluation, as well as skills to evaluate real-time corrosion-related issues and to specify pertinent remedy/prevention approaches to combat corrosion-related problems at their respective work places. STORM In addition, special emphases are given to electrochemical coating process technologies for corrosion and wear preventions, covering electroplating, electroless plating and various passivation processes for metals, together with coatings that can be produced with such process technologies.

**Modules**
1. Implement fundamentals of Corrosion and Corrosion Prevention
2. Apply Advanced Coating Technologies for Corrosion Prevention
3. Apply Electro-chemical Processes and Coatings for Wear and Corrosion Protection

*Note: Candidate can register for individual module(s).

**Statements of Attainments Awarded**
1. WSQ Implement fundamentals of Corrosion and Corrosion Prevention
2. WSQ Apply Advanced Coating Technologies for Corrosion Prevention
3. WSQ Apply Electro-chemical Processes and Coatings for Wear and Corrosion Protection

**Target Audience**
Personnel working in Chemicals, Construction, Food and beverages, Infrastructure (power, water, roads, and transport), Marine, Oil and gas.

**Course Duration**
- Module 1: 42 hours
- Module 2: 39 hours
- Module 3: 30 hours

**Course Fee**
- Module 1-2:
  - Full Fee: $3,000.00 per module (excluding GST)
  - Nett Fee (Singaporeans/PRs): $900.00 per module (excluding GST)
- Module 3:
  - Full Fee: $2,100.00 (excluding GST)
  - Nett Fee (Singaporeans/PRs): $630.00 (excluding GST)

Additional Enhanced SME Funding of 90% of course fee available for application.

Fees are subject to changes by the training providers.
<table>
<thead>
<tr>
<th><strong>WSQ Programme in Implement Lean Manufacturing</strong></th>
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</thead>
<tbody>
<tr>
<td><strong>Description</strong></td>
</tr>
<tr>
<td><strong>Module</strong></td>
</tr>
<tr>
<td><strong>Statements of Attainments Awarded</strong></td>
</tr>
<tr>
<td><strong>Target Audience</strong></td>
</tr>
<tr>
<td><strong>Course Duration</strong></td>
</tr>
</tbody>
</table>
| **Course Fee** | Full Fee: $4,000 (excluding GST)  
Nett Fee (Singaporeans/PRs): $1,200 (excluding GST)  
Additional Enhanced SME Funding of 90% of course fee available for application. |

**GRADUATE DIPLOMA COURSES**

**SINGAPORE INSTITUTE OF MANUFACTURING TECHNOLOGY (SIMTech)**

Enquiries & Applications:  
Course Enquiries:  
Ms Laura Xu  
Tel: 6793 8395  
Email: xxxu@SIMTech.a-star.edu.sg

Enquiries & Applications:  
Course Application:  
http://kto.SIMTech.a-star.edu.sg

<table>
<thead>
<tr>
<th><strong>WSQ Improve Machining Productivity through Dynamics Analysis and Simulation</strong></th>
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</thead>
<tbody>
<tr>
<td><strong>Description</strong></td>
</tr>
<tr>
<td><strong>Module</strong></td>
</tr>
<tr>
<td><strong>Statements of Attainments Awarded</strong></td>
</tr>
<tr>
<td><strong>Target Audience</strong></td>
</tr>
<tr>
<td><strong>Course Duration</strong></td>
</tr>
</tbody>
</table>
| **Course Fee** | Full Fee: $4,500.00 (excluding GST)  
Nett Fee (Singaporeans/PRs): $1,350.00 (excluding GST)  
Additional Enhanced SME Funding of 90% of course fee available for application. |

Fees are subject to changes by the training providers.
### WSQ Improve Productivity through RFID-enabled Workflows Innovation Framework

**Description**
This modular WSQ course is designed to train the participants on a set of tools and skills to innovate their existing workflows with the use of RFID technology to improve productivity, which is highly demanded by local manufacturing companies to improve their manufacturing productivity. On completion, participants will be able to streamline and enhance work flows with RFID for capacity improvement and wastage reduction, perform cost-benefits analysis and productivity assessment, and develop pilot and full scale implementation plan in a the Productivity Improvement with RFID-enabled Workflows Proposal as the final report.

<table>
<thead>
<tr>
<th>Module</th>
<th>Improve Productivity through RFID-enabled Workflows Innovation Framework</th>
</tr>
</thead>
<tbody>
<tr>
<td>Statements of Attainments Awarded</td>
<td>WSQ Improve Productivity through RFID-enabled Workflows Innovation Framework</td>
</tr>
<tr>
<td>Target Audience</td>
<td>Personnel working in all industry sectors.</td>
</tr>
<tr>
<td>Course Duration</td>
<td>40 hours</td>
</tr>
</tbody>
</table>
| Course Fee | Full Fee: $3,000.00 (excluding GST)  
Nett Fee (Singaporeans/PRs): $900.00 (excluding GST)  
Additional Enhanced SME Funding of 90% of course fee available for application.  
Fees are subject to changes by the training providers. |

### WSQ Programme in Implement OEE for Productivity Improvement

**Description**
This modular WSQ course is designed to train the participants the knowledge and skills to improve their existing machines availability, performance and quality with the use of OEE technology, which is highly demanded by local manufacturing companies for their manufacturing productivity improvement.

<table>
<thead>
<tr>
<th>Module</th>
<th>Implement OEE for Productivity Improvement</th>
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</thead>
<tbody>
<tr>
<td>Statements of Attainments Awarded</td>
<td>WSQ Implement OEE for Productivity Improvement</td>
</tr>
<tr>
<td>Target Audience</td>
<td>Personnel working in all industry sectors.</td>
</tr>
<tr>
<td>Course Duration</td>
<td>48 hours</td>
</tr>
</tbody>
</table>
| Course Fee | Full Fee: $4,000 (excluding GST)  
Nett Fee (Singaporeans/PRs): $1,200 (excluding GST)  
Additional Enhanced SME Funding of 90% of course fee available for application.  
Fees are subject to changes by the training providers. |
# APPROVED TRAINING ORGANISATIONS

<table>
<thead>
<tr>
<th>NAME</th>
<th>CONTACT DETAILS</th>
</tr>
</thead>
</table>
| **CAD-IT Consultants (Asia) Pte Ltd** | Ms Jessie Chan / Miko Ngiu / Precilla Eurico  
Tel: 6508 7575  
Email: training@cadit.com.sg  
Web: www.cadit.com.sg |
| **Cutech Quality Solutions Pte Ltd** | Ms Poonkodi  
Tel: 6665 0187  
Email: training@cutechgroup.com |
| **Electronics Industries Training Centre (ELITC)** | Tel: 6483 2535  
Fax: 6483 1700  
Email: elitc@singnet.com.sg / emarketing@elitc.com  
Web: www.elitc.com |
| **Festo Pte Ltd** | Ms Normah Mugtaffa  
Tel: 6415 6739  
Email: normah.mugtaffa@sg.festo.com  
Mr Edward Gasper  
Tel: 6415 6761  
Email: edward.gasper@sg.festo.com |
| **Institute of Technical Education (ITE)** | Institute of Technical Education  
2 Ang Mo Kio Drive, Singapore 567720  
Tel: 1800-CALL ITE (1800-2255 483)  
Fax: 6590 2418  
Email: idt@ite.edu.sg  
Web: www.ite.edu.sg/qsq |
| **Nanyang Polytechnic (NYP)** | Course Enquiries:  
Mr Nah Yeong Teck  
Tel: 6550 0986  
Email: nah_yeong_teck@nyp.edu.sg  
Mr Mike Kwek  
Tel: 6550 0677  
Email: mike_kwek@nyp.edu.sg  
Application Enquiries:  
Professional Development Centre  
Tel: 6550 0555  
Email: nyp_pdc@nyp.edu.sg  
Online Course Application:  
Web: www.nyp.edu.sg/nyppdc/course-calendar.aspx |
| **SETSCO Services Pte Ltd** | Mr Andy Cheong Kok Fei  
Tel: 6895 0626  
Email: andycheong@setsco.com  
Mr See Wah Kiaw  
Tel: 6895 0633  
Email: seewk@setsco.com  
Web: www.setsco.com |
| **Singapore Institute of Manufacturing Technology (SIMTech)** | Course Enquiries:  
Dr Lim Gnan Cher  
Tel: 6793 5489  
Email: gcclim@SIMTech.a-star.edu.sg  
Course Application  
Web: http://kto.SIMTech.a-star.edu.sg |
| **Singapore Polytechnic (SP)** | Professional & Adult Continuing Education (PACE) Academy  
Tel: 6772 1288  
Email: pace@sp.edu.sg  
Web: pace.sp.edu.sg |

Information updated as of print. Refer to www.era.gov.sg for latest list of training providers.
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