PE WSQ GRADUATE DIPLOMA IN PRECISION MEASUREMENTS AND CHARACTERISATION

Engineering Optics and Optical Measurements (42 hours)

This course provides knowledge and techniques of optical design, testing and engineering that are widely used for dimensional measurements and inspection. The course is structured into lectures of fundamental optics principles and case studies. The topics covered include applied optics, lighting design, detection technology, imaging and sensing system. After these topic lectures, the participants will apply what they learn on a personalised case study of their choice. With this extra practice element, the participants are instilling skill and attitude as well as acquiring knowledge. This will enable learners to perform actual tasks in their workplace more effectively and efficiently.

Why This Course

Knowledge of optics and optical measurement techniques will allow precision testing and measurements professionals and their managers to grasp the technical details of advanced optical measurement and inspection, and apply them to improve their factory performance, product quality and business portfolio.

Some unique features of this course are the hands-on sessions and personalised case studies. Participants will have the opportunity during the course to raise real problems from their workspaces and to use optical components, set-ups and instruments for further understanding of engineering optics and to find solutions of the problems.

Who Should Attend

This module is designed for
- Chief information officer/Chief technology officer
- Project manager
- Engineers and technical staff in optics, precision measurements, quality control, machine vision
- Sales engineers and officers

When & Where

Please visit our website at KTO.SIMTech.a-star.edu.sg for the updated course schedule.

Training Venue:
Singapore Institute of Manufacturing Technology
2 Fusionopolis Way, Innovis, Level 8, Singapore 138634
What You Will Learn

**Optical Design and Simulation**
- Geometrical optics, image formation and aberrations
- Optical design and simulation by ZEMAX

**Lighting Technologies**
- Feature enhancement by lighting for machine vision
- Simulation and design of LED illumination
- Lighting for dimensional measurements

**Optical Detection**
- Detectors and detection electronics
- Detection of weak optical signal

**Fiber Optics Sensing Technologies**
- Fiber optics and fiber sensors
- Industrial applications: stress, strain, temperature, chemical and imaging

About the Course Leaders

**Dr Li Xiang** is a Senior Research Engineer from the Singapore Institute of Manufacturing Technology, SIMTech. His research areas include dimensional measurements, defect inspection, interferometry, wavefront sensing, fiber sensor and bio-imaging etc. His research outputs have been applied in sectors of semi-conductor, precision engineering, construction and biomedical etc.

**Dr Ng Boon Ping** is a Scientist from the Precision Measurements Group at SIMTech. He focuses in the research area of nanoscale optical measurement. He had developed in-house capabilities on the instrumentation of the scanning near-field optical microscope. Dr Ng was formerly attached to the National Institute of Standard and Technology (NIST), USA in 2012 and Physikalisch-Technische Bundesanstalt (PTB), Germany in 2013. During his attachments, he investigated the metrology issues on the Atomic Force Microscope and Optical Scatterometry. Upon his return to Singapore, he rejoined SIMTech's Precision Measurements Group and leads projects in nanoscale measurement for Mid-IR/X-ray wavelengths and wide-angle optical systems.

**Dr Li Hao** is a Scientist from SIMTech. He is experienced in complex optical system development for optical sensing, bio-optical imaging, nonlinear optics and X-ray optics for more than 10 years. He had developed numbers of optical systems for industry application or academic research purposes such as fiber acousto-optic modulator, plasmonic bio-sensor, nonlinear laser scanning microscope, laser endoscope system, coherent EUV source etc. He joined the SIMTech's Precision Measurements Group in 2010 and since then, lead several industry and research projects. Currently his research is focused on nonlinear optics for super resolution imaging and table-top coherent X-ray generation.

Course Fee and Funding

- The course fee for this module is S$3,000 before course fee funding & GST.
- All Singaporeans and Permanent Residents aged 21 years and above can enjoy course fee funding of up to 70% of the course fee.
- Singaporean or Permanent Resident employees fully sponsored by SMEs can enjoy course fee funding support of up to 90% of the course fee under the Enhanced Training Support for Small & Medium Enterprises (SMEs) scheme, subject to eligibility criteria.
- Singaporeans aged 40 years and above can enjoy course fee funding of up to 90% of the course fee under the SkillsFuture Mid-career Enhanced Subsidy (MCES).
- Singaporeans aged 35 years and above with earnings not more than S$2,000 per month can enjoy course fee funding for 95% of the course fee under the Workfare Training Support (WTS) scheme.
- Singaporeans aged 25 years old and above are eligible for SkillsFuture Credit which can be used to offset course fees.

For more information about the course fee funding, please visit [www.ssg.gov.sg](http://www.ssg.gov.sg)