This course equips participants with the fundamental tools needed to analyse, design and tune controllers with in-depth analysis of key considerations for precision control, such as uncertainty analysis, noise sources and filtering, and metrology and error sources, to name a few. The knowledge gained will enhance the participant’s ability to increase machines’ performance in terms of precision, accuracy, speed and reliability. The participants will also gained awareness of the capabilities of various high-tech equipment, latest concepts at the forefront of precision engineering for actuation and sensing. Various case studies on error compensation, self-calibration, as well as practical implementation for control in some technology areas such as voice coil motors and permanent magnet linear motors will be used to impart the techniques which can be applied immediately to engineering issues in the day-to-day operation.

Why This Course

- Designed specifically based on local industry demand
- Highly practical and intensive
- Latest knowledge and up-to-date technologies
- Case studies highlighting industrial applications
- Expert trainers in the field with industrial experience

Who Should Attend

This course targets at mechatronics/mechanical/electrical/control engineers, precision machines and automation systems designers and researchers, process engineers and plant supervisors. The course is also relevant for participants from industries, such as precision engineering, electronics, machine tools, automotive, aerospace, optics, semiconductor and etc, where accuracy capability and performance is critical to the production.

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

The course covers the following performance statements:

- Understand the purpose of control systems and basic knowledge of PID (Proportional, Integral, Derivative) control
- Understand the purpose of system modeling
- Perform system identification for linear systems
- Understand the design of PID control using model based approach
- Distinguish between repeatability, resolution, and accuracy
- Perform steps to calibrate and improve machine performance
- Building mathematical model of a thermal system using thermal equations and perform analysis to determine & select suitable heater
- Understand a servo control system
- Appreciate and evaluate a precision close-loop positioning system
- Construct a servo motor drive system with digital signal controller
- Gain the knowledge on industrial communication interfaces, protocols their limitations and applications

About the Course Leader

Dr Teo Chek Sing completed his PhD degree at the National University of Singapore in 2008, under the Agency for Science Technology and Research (A*STAR) Scholarship Scheme, working on “Accuracy Enhancement for High Precision Gantry Stage”. His research interests are in the application of advanced control techniques to precision mechatronic system and instrumentation; to enhance performance in motion control and measurement. His current work includes using mechatronics stiffness to reduce jerk reaction in high speed motion stage and sensor placement for adaptronics. He currently leads the Precision Mechatronics Team within SIMTech’s Mechatronics Group, as well as the co-Director of the SIMTech-NUS Precision Motion System joint lab.

Course Fee and Funding

- The full course fee for this module is $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 $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