By the end of this program you will be able to:

- Explain the basic thermodynamic principles behind gas turbines
- Understand the basic operation of a gas turbine
- Clearly describe the operation and function of gas turbine components
- Perform simple troubleshooting and maintenance
- Do a simple review of the successful operation of a gas turbine and know what characteristics are required for materials and fuels
- Perform simple condition monitoring interpretation and maintenance

We have taken all the key troubleshooting and problem solving skills from experienced engineers and distilled these into one intensive program to enable you to solve real gas turbine problems.

SECURE YOUR PLACE NOW!
Contact enquiries@eit.edu.au for an application form or more information.
Simulation software and remote labs. Practical exercises will be conducted using submitted electronically and wherever possible, interactive software system. Assignments will be due prior to the program. Discussions will be conducted using a live presentation.

Software package and setup details will be sent to participants from around the world. Each webinar will last approximately 90 minutes, and we take student availability into consideration wherever possible before scheduling webinar times. Contact us for details of webinar session scheduling. All you need to participate is an adequate Internet connection, speakers and a microphone. The software package and setup details will be sent to you prior to the program.

Please note: Webinars may last up to 2 hours depending on student interaction and level of content.

PRESENTED BY

TOM NEILLINGS
Dip EE, Dip Bus Mngmt

Tom started his career as an engine fitter in the RAF. After leaving the RAF Tom worked in oil and gas North Sea projects, during this period he gained valuable experience and knowledge of diesel power generating systems operating in harsh environments. Tom continued his career in South Africa with a short period in Saudi Arabia.

Tom’s down-to-earth and practical, yet entertaining approach to the subject of gas turbines makes him a sought after speaker and lecturer in this area. His enthusiastic approach to training coupled with his helpful nature is guaranteed to maximize the learning outcome for his delegates.

Please note: Lecturers are subject to change.

12 MODULES OVER 3 MONTHS

OVERVIEW

The gas turbine engineering function in any organisation encompasses many disciplines touching upon different aspects of gas turbine plant operation and facility management. The advent of new gas turbine designs and applications has transformed this function into one that is becoming highly specialised and increasingly sophisticated. In recent times, there is huge demand for highly skilled, knowledgeable and practically oriented gas turbine engineers. The certificate has been designed and structured keeping this fact in mind.

This program provides a comprehensive overview in the area of gas turbine engineering and is designed to develop your overall skills, boost your career options and benefit your employer. The numerous practical application tips and short cuts to engineering problem solving are imparted during the program making it highly practical and relevant to your applications and its successful completion will provide a gateway to a fulfilling and intensive yet enjoyable career.

Ease of installation, serviceability and operational and design flexibility are critical factors determining the success of any gas turbine installation. In order to identify and select a suitable system for a particular application, it is important that the selection and design related parameters are properly understood. For example, fuel economy is critical in the success of any Gas Turbine operation.

This program places the tried and tested and latest practices and technologies in perspective, while also equipping the participants with the requisite knowledge and skill sets needed to tackle problems related to various systems in a facility. It is presented by an instructor who is a highly experienced engineer from industry, having a mix of both extensive experience and teaching skills. The topics covered are derived from the acclaimed IDC Technologies’ programs attended by over 500,000 engineers and technicians during the past 20 years.

INCLUDES 4 FREE REFERENCE MANUALS

VALUED AT OVER US$400

YOU WILL RECEIVE 4 OF OUR UP-TO-DATE TECHNICAL E-BOOKS TO ADD TO YOUR LIBRARY.

- Fundamentals of Mechanical Engineering
- Practical Machining Vibration Analysis and Predictive Maintenance
- Practical Hydraulic Systems: Operation and Troubleshooting
- Practical Lubrication Engineering for Engineers and Technicians

Received upon completion.

All materials required for the program will be provided electronically, in smaller, easy-to-read sections. Please Note: e-Books are available in hard copy at 50% of the recommended retail price. Contact us for pricing details.
PROGRAM OUTLINE

MODULE 1: GENERAL OVERVIEW OF GAS TURBINES
• Introduction
• Frame type heavy-duty gas turbines
• Industrial type gas turbines
• Aircraft derivative gas turbines
• Comparison between aircraft-derivative and industrial heavy-duty turbines
• Small and micro gas turbines
• Aircraft gas turbines
• Gas turbine components
• Siemens Gas Turbine Technology

MODULE 2: FUNDAMENTAL GAS TURBINE CYCLE THERMODYNAMICS
• Reversible cycles with ideal gases
• Constant pressure or Brayton cycle
• Ideal inter-cooled and reheat cycles
• Actual gas turbine cycles
• List of terms and symbols used

MODULE 3: GAS TURBINE COMPONENTS
• Compressors
• Centrifugal compressors
• Axial-flow compressors
• Compressor theory
• Compressor aerodynamics
• Common problems affecting axial compressor operation and performance
• Air compressor performance characteristics
• Combustors
• Combustor performance and efficiency
• Turbines
• Fuel nozzles and igniters
• Emission control

MODULE 4: MATERIALS OF CONSTRUCTION
• Introduction
• General metallurgical behavior in gas turbines
• Gas turbine blade materials
• Blade manufacturing techniques
• Future materials

MODULE 5: BEARINGS AND SEALS
• Bearing materials
• Through hardened materials
• Case hardened materials
• Cage materials
• Babbitts
• Bearing design principles
• Tilting-pad journal bearings
• Design of thrust bearings
• Seals

MODULE 6: LUBRICATION SYSTEM IN GAS TURBINES
• Introduction
• Oil reservoir
• Pumps and oil jets
• Lubrication oil filters
• Oil coolers
• Relief valves
• Lubricant selection
• Oil system cleaning and conditioning
• Filter selection
• Oil sampling and testing

MODULE 7: FUELS AND FUEL SUPPLY SYSTEMS
• Introduction
• Fuel specifications and fuel properties
• Fuel treatment, economics of fuel selection
• Gas fuels, heavy fuels
• Comparative fuel costs
• Cleaning of turbine components
• Fuel supply and control systems
• Dual-fuel operation and operational flexibility
• Integrated gasification combined cycles

MODULE 8: SOUND SUPPRESSION IN EXHAUSTS, AIR REQUIREMENTS AND ENVIRONMENTAL CONSIDERATIONS
• Noise from gas turbine engines
• Aircraft sound suppression methods
• Air requirements and environmental considerations

MODULE 9: AUXILIARY SYSTEMS
• Starting systems
• Fuel washing systems
• Gears
• Gear design and performance parameters
• Couplings and shaft alignment
• Shaft alignment

MODULE 10: PERFORMANCE AND MECHANICAL EQUIPMENT STANDARDS
• Introduction
• Performance standards
• Mechanical standards

MODULE 11: CONTROL SYSTEMS AND INSTRUMENTATION
• Control systems
• Startup and shutdown considerations
• Control of the equipment during operation
• Lifecycle costs
• Condition monitoring systems and their implementation
• Temperature, pressure and vibration measurement
• Campbell diagram
• Gas turbine performance measurement and calculations
• Protection systems and alarms
• Failure diagnostics

MODULE 12: INSTALLATION REQUIREMENTS, OPERATION AND MAINTENANCE
• Installation requirements
• Philosophy of maintenance
• Maintenance techniques and tools
• Maintenance of critical gas turbine components
• Maintenance planning and scheduling
• Spares and inventory management
• Inspection
• Gas turbine overhaul and repair
• Training, training types
• Typical problems
• Health monitoring in gas turbines
• Troubleshooting in gas turbines
• General troubleshooting techniques for compressors, combustors and turbines
• Evaluation of the effectiveness of gas turbine maintenance

HARDWARE AND SOFTWARE REQUIREMENTS
All you need to participate is an adequate Internet connection, PC, speakers and a microphone. The software package and setup details will be sent to you on the program start date.

ENTRANCE REQUIREMENTS
Some practical work experience in some of these topics would obviously be advantageous.

PRACTICAL EXERCISES
Throughout the program you will participate in hands-on exercises using simulation software, which will help you put theory to practice immediately.

CERTIFICATION
Participants completing all the assignments and achieving at least 50% or more in each assignment, as well as attending 65% of the live webinars, will receive the Engineering Institute of Technology Professional Certificate of Competency in Gas Turbine Engineering.

ON-SITE TRAINING
We can provide our training at the venue of your choice. On-site training can be customised and brought to you by bringing the trainer to site, the dates can be set to suit you!

“The Customer is Always Right” – so tell us what you need and we will design a training solution at your own site.

For a FREE detailed proposal please contact Kevin Baker via e-mail:
training@idc-online.com