

# BEAM

## Building Energy Auditing & Management Professional Development Course



School of Engineering

### Course overview

This course is aimed at consulting engineers and architects practising in the field of commercial building energy auditing and energy efficiency improvement.

It is designed to provide a sound understanding of the current legislative requirements of energy auditing as well as the processes used to assess and report on the energy efficiency of existing commercial buildings.

It also covers energy reduction options and ways to improve the Energy Rating of existing buildings

### Course delivery

This course is delivered in an intensive short course format which has proven a popular option with busy people and includes a distance education component. It allows participants to study at their own pace and to combine learning with work and other commitments.

The distance education format also enables participants from around Australia to complete the course.

The proposed syllabus appears overleaf. Assessment will be by course work and

### Course summary

- Part 1: Statutory Requirements
- Part 2: Sources of Energy Used in Commercial Buildings  
(advantages & disadvantages of)
- Part 3: Energy: Concepts and Movement
- Part 4: Energy Consumers
- Part 5: Ancillary Devices and Systems
- Part 6: Control Equipment
- Part 7: Case Studies
- Part 8: Course Assignment & Assessment for University Credit

### Course Dates 2011

4<sup>th</sup>, 5<sup>th</sup> & 6<sup>th</sup> April, 2011

#### Presenters:

**Graeme Vertigan – UTAS**

28 yrs experience in industrial power  
& tertiary education

**Dr. Jane Sargison – UTAS**

Rhodes Scholar & Senior Lecturer at School of  
Engineering

**Andrew Sutherland – ASC Engineers**

28 yrs experience in Building Services Design &  
Building Energy Efficiency

**Richard Bevan – Electrical Engineer**

Former CEO Transend



#### Further Information:

For technical information contact  
Graeme Vertigan at:

graeme.vertigan@utas.edu.au

Or by telephone: 0408 400 676

And for Registration enquiries contact  
Phil Holmes at:

mail@conventionwise.com.au

Or by telephone: (03) 6234 1424



# BEAM

## Building Energy Auditing & Management Professional Development Course



### School of Engineering

#### Course in detail

##### Part 1: Statutory Requirements

- National Energy & Greenhouse Emissions Reporting Scheme (NEGERS) ■ Mandatory Energy Reporting for Commercial Buildings ■ National Australian Building Energy Reporting Scheme (NABERS) ■ NABERS Accredited Assessors ■ Carbon Emission Accounting Software
- Load Estimation Software, (Camel, NABERS) ■ Renewable Energy Credits (RECS) AS3598 Energy Audits Level 1, 2 and 3.

##### Part 2: Sources of Energy Used in Commercial Buildings—Advantages & Disadvantages of

- Electricity ■ Gas, Diesel ■ Solar ■ Geo Thermal ■ CHP (co-generation, Tri-generation)

##### Part 3: Energy: Concepts and Measurement

- Electricity: The National Electricity Market (NEM), role of the Australian Energy Market Operator (AEMO), Energy Concepts (KWhrs, KVAhhrs, KVA), Supply Tariffs, Maximum Demand, Electricity Metering, Metering Intervals, 3 Wire & 4 Wire Metering Connections, Electronic Energy Meters, Data Loggers, Demand Tariffs, Time of Use, Effects of Harmonics & Non-Linear Loads on the Electrical System.
- Gas/Diesel: The National Gas Market, AEMO, Calorific Value of Gas (energy content), Gas Meters, Measurement of Gas Volumes, Correction to STP, The Combustion Process, Excess Air/Fuel, Combustion of Efficiency, Waste Heat, Flue Gas Analysis, Flue Heat Recovery (flue heat exchangers)

##### Part 4: Energy Consumers

- Space Heating ■ Lighting ■ Air Conditioning, Ventilation (HVAC) ■ Water Heating ■ Lifts, Escalators ■ Benchmark Consumption: kWhrs/m<sup>2</sup>/yr, kWhrs/person/yr ■ NABERS Statutory Data: Geographic Location Specific.

##### Part 4: Energy Use In-Efficiencies

- Space Heating: Hours of Use, Poor Building Design, Building Location, Insulation Levels
- Lighting: Incandescent vs Fluorescent, Compact Fluorescent Lamps (CFL), Lighting Standards (Safety Requirements, Minimum Acceptable Light Levels, Current Harmonics)
- Hot Water Heating: System Capacity, Operating Temperature, Insulation Requirements, Cylinder Location ■ Domestic Commercial GPO Loads: Standby Mode, Computer Systems.

##### Part 5: Ancillary Devices and Systems

- Centrifugal Pumps: Characteristics, Flow, Head & Power, Speed, Pump Curves, Head-Flow, Speed Conversion ■ Fans: Axial & Tangential, Affinity Laws, Characteristics, Fan Curves, Flow, Head & Power, Speed ■ Heat Exchangers: Shell & Tube, Plate, Coil & Condensing Heat Exchangers, Efficiency Maintenance ■ Boilers & Water Heaters: Fire Tube/Water Tube Boilers, Fuels, Combustion, Fuel Metering, Air Fuel Ratio ■ Induction Motors: Characteristics, Torque Speed Curve, Starting Techniques, Speed Control
- Variable Speed Drives: Capabilities, V-F Characteristic, Starting Torque, Speed Range
- Refrigeration Systems: Principles, COP, Reverse Cycle Systems, Energy Efficiency.

##### Part 6: Control Equipment

- Temperature Measurement & Control (Thermocouples, RTDs) ■ Lighting Controllers (Daylight Sensing, Motion Sensing, DALI Control)
- Time Switches ■ PLC Based Building Management Systems ■ Demand Controllers
- Power Factor Correction Equipment ■ Harmonic Filters

##### Part 7: Case Studies

- Level 1 Audit Example (with Energy Saving Recommendations) ■ Level 2 Audit Example
- Level 3 Audit Example (Including Costing & Specifications for the Energy Saving Options Identified).

##### Part 8: Course Assignment & Assessment for University Credit

- Conduct a Level 2 Energy Audit on Your Workplace

#### Registration

The closing date for registration is:  
Monday, 23<sup>rd</sup> March, 2011.

##### Course Fees

**\$2,500** (inclusive of GST)

In addition, the following cumulative discounts shall apply:

- 20% for early bird registrations paid by 28<sup>th</sup> February, 2011
- 20% for group registrations for four people or more
- 10% discount for CREPS members

For Registration enquiries contact  
Phil Holmes:

Email: [mail@conventionwise.com.au](mailto:mail@conventionwise.com.au)  
Or by telephone: (03) 6234 1424



#### Further Information:

For technical information contact  
Graeme Vertigan at:  
[graeme.vertigan@utas.edu.au](mailto:graeme.vertigan@utas.edu.au)  
Or by telephone: 0408 400 676