

Postgraduate Programs in

Master of Engineering (Sustainable Energy)

MC149 Master of Engineering

GD149 Graduate Diploma

GC115 Graduate Certificate

CRICOS: 053363A

CRICOS: 053362B

CRICOS: 053361C

School of Aerospace, Mechanical & Manufacturing Engineering



This new program provides a pathway for engineers and scientists, or those with an alternative acceptable qualification and significant experience in industry, to gain a masters qualification in the burgeoning specialist area of 'sustainable energy'. Sustainable energy embraces technologies and practices to improve efficiency and reduce adverse environmental and social impacts of conventional energy sources, and to utilise alternative renewable energy sources.

With increasing international concern about climate change, energy security, rising and fluctuating energy prices, and pollution associated with energy production and consumption, managing the transition towards a more sustainable energy sector has become a priority concern for governments, the private sector, and the general community alike. There is thus a rapidly growing demand for engineers and scientists with a postgraduate specialisation in sustainable energy in Australia and internationally.

Outcomes

Graduates from this program will be able to take a lead role in their organisations in, for example:

- Developing and implementing plans to improve energy efficiency and productivity in order to cut fuel bills and reduce greenhouse gas and other pollution emissions to meet regulatory and other requirements
- Researching, developing, demonstrating, commercialising, designing and evaluating innovative solar, wind, biomass, hydrogen and other sustainable energy supply, storage and utilisation technologies
- Implementing Environmental Management Systems and obtaining ISO 14001 certification
- Devising innovative sustainable solutions to current problems associated with adverse environmental and social impacts of energy supply, distribution and consumption
- Maintaining and optimising the performance of installed sustainable energy technologies and systems
- Managing consultative processes with social groups impacted by energy-related projects and developments
- Analysing the implications of and responding to governmental and international energy and related policy developments
- Training and raising awareness of fellow employees in the opportunities afforded by sustainable energy practice

The Program

You are able to tailor the program to meet your needs. Case study topics can be selected to suit your interests. You will be encouraged to select a topic for your major research project in the final stage of the program that is of personal interest and (where relevant) of interest to your employer, so that your study is founded upon a strong personal motivation and has practical relevance. The research project will be undertaken individually, but there will be an opportunity for students to work collectively in small groups to assist each other in research design and get regular constructive feedback from peers.

Those not wishing to complete the Masters may complete the Graduate Certificate (one semester full-time equivalent) or Graduate Diploma (two semesters full-time equivalent).

A ground-breaking aspect of this program is to set the emergent transition to a more sustainable energy sector within a broad economic, socio-political and environmental context. To achieve this, the program uses new integrative approaches from the sociology of technology, technology policy and sustainability fields. These approaches include social shaping of technology, constructive technology assessment, strategic niche management, industrial ecology, and lifecycle and triple bottom line (economic, environmental and social, not just financial) assessment. The rationale is that the arguments for a shift to a sustainable energy option are invariably multi-dimensional, embracing strong environmental and socio-political drivers, and not just narrow financial and technical factors.

Lecturers and Presenters

The program will be delivered by a highly-experienced team of RMIT specialists, with input from a range of other experts in particular areas within the sustainable energy field.

The RMIT team comprises:

- Dr John Andrews, Program Leader, a sustainable energy specialist with over 25 years experience in government, industry and academia
- Dr Andrea Bunting, Lecturer, 15 years tertiary teaching, specialising in wind energy technology and policy
- Professor Aliakbar Akbarzadeh, international expert on renewable energy with 30 years tertiary teaching
- Chris Dixon, Lecturer, an expert on heat pumps and air conditioning with 20 years tertiary teaching.

Other experts from a range of organisations involved in sustainable energy research, development, and commercialisation will also contribute to the program.

Some of Australia's leading experts on specialist areas of sustainable energy who gave presentations to classes in the Master of Engineering (Sustainable Energy) program in semester 2, 2005 included:

- Sukhvinder Badwal, Chief Research Scientist, CSIRO Manufacturing and Infrastructure Technology, on hydrogen technologies and the hydrogen economy
- Professor Robin Batterham, Riotinto (formerly Chief Government Scientist) on low-emission fossil-fuel utilisation
- Brian Barnett, Senior Consultant, Sinclair Knight Merz, on geothermal energy
- Ken Guthrie, Principal Project Manager, Sustainability Victoria, on solar thermal systems
- David Oppenheim, Director, Sustainable Built Environments, on passive solar building design
- Grant Flynn, Sustainable Energy Australia, on wind power and wind farm design
- Ron Mendelsohn, Director, Sunspun, on biomass fuels
- Dr Patrick Moriarty, Monash University, sustainable transport

Mode and Duration

Note: part-time study is not available to International Students.

Masters: one and a half years full-time, or 3 years part-time.

Graduate Diploma: one year full-time, or two years part-time.

Classes are normally scheduled in the evenings on the City Campus, with some laboratory session at Bundoora. Students usually attend two evening classes a week and some weekend sessions to complete each stage in one year.

Entrance Requirements

Local Students

Direct entry to the Master of Engineering or Graduate Diploma normally requires a relevant undergraduate degree.

Advanced standing may be given on the basis of significant industry experience and/or relevant postgraduate studies.

Entry to the Graduate Certificate may be considered for those who lack the academic qualifications but have significant work and professional experience. Successful completion of the Graduate Certificate may qualify a student to proceed to the Graduate Diploma, and successful completion of the Graduate Diploma may qualify a student to proceed to the Master of Engineering.

International Students

English Language

One of the following:

- ELTS – 6.5+ (no band less than 6.0)
- TOEFL – Paper based = 580+ (TWE 4.5+)
- TOEFL – Computer based = 237+ (TWE 4.5+)
- REW – English for Academic Purposes Advanced 1 & 2

Academic

Applicants should have a recognised bachelor degree in engineering, science or related discipline. An equivalent combination of employment experience and academic qualifications will also be satisfactory.

Facilities

The Renewable Energy Park and Laboratory at Bundoora East Campus contain a passive solar conservation building, solar water heaters, photovoltaic systems, solar ponds,

solar- aerogenerator, electric pumping, and micro hydro demonstration. There is also a thermofluids laboratory on campus.

Teaching Methods

Teaching may consist of a mix of master classes and workshops, online conferencing and virtual project teams.

Assessment

Assessment is ongoing throughout the semester and may include examinations, essays/reports, oral class presentations, group projects, research projects, laboratory projects and practical assignments.

Program Structure

Please Note: part-time study is not available to International Students.

Each level - Graduate Certificate, Graduate Diploma and Master - requires completion of 48 credit points.

Graduate Certificate 1 semester full time; 2 semesters part time	credit points
The economic, social & environmental context for sustainable energy	12
Sustainable energy systems and design	12
Energy efficiency and demand management	12
<i>Plus one elective</i>	12
TOTAL	48

Graduate Diploma 2 semesters full-time; 4 semesters part time	
<i>All Graduate Certificate courses (48 credit points) plus</i>	
Sustainable energy technologies I	12
Sustainable energy technologies II	12
<i>Plus two electives (12+12)</i>	24
TOTAL	96

Master of Engineering 3 semester full time; 6 semesters part time	
<i>All Graduate Diploma courses (96 credit points) plus</i>	
Developing and evaluating proposals for sustainable energy systems	12
Sustainable energy design project	24
<i>Plus one elective</i>	12
TOTAL	144

Further Information

Program Leader: Dr John Andrews
School of Aerospace, Mechanical & Manufacturing Engineering
Tel: +61 3 9925 6085 or 9925 4353
Fax: +61 3 9925 6108
E-mail: andrews.john@rmit.edu.au

www.rmit.edu.au/programs/MC149
RMIT CRICOS Provider Code 00122A