Biographies

Professor Mark Taylor – BE Hon, PhD C&M Eng, FIChemE University of Auckland

Mark Taylor graduated from Auckland University in 1984 with a PhD in Chemical and Materials Engineering. His career with the Comalco organisation spanned 18 years in a variety of roles including Implementation Manager for the smelter upgrade, Potroom Manager NZAS, General Manager Technology, General Manager at Boyne Smelters Ltd. Mark returned to the Auckland University in January 2003 as the Director, Light Metals Research Centre and is engaged in light metals research and consulting globally.

Professor John Chen – BE, PhD C Eng, FIChemE, FIPENZ, FRSNZ University of Auckland

John J.J. Chen has worked in an aluminium smelter for 3 years, and has been an academic for 25 years, with 8 of those (1996-2004) as Head of the Department of Chemical and Materials Engineering, University of Auckland. He has published over 180 papers in international journals and conference proceedings, and over 60 proprietary technical reports. He has won the Best Reduction Technology Paper Awards at TMS in 1992, 1993 and 1996. His current research covers a number of areas in aluminium smelting technology.

Associate Professor Margaret Hyland – PhD MRSNZ MTMS MAMS University of Auckland

Margaret Hyland has 15 years experience in aluminium smelting technology research and is a three-time recipient of the TMS Light Metals Award.
She has worked with numerous aluminium producers and suppliers on fluoride and sulfur emissions and capture; chemical and mechanical properties of cathode and anode materials; development of new materials.

Professor James Metson – BSc Hons PhD FNZIC MRSNZ MTMS University of Auckland

James Metson has gained an international reputation in aluminium reduction technology for his research on environmental aspects of smelting; materials performance; alumina structure; and impurity transport. He has a broad knowledge of the light metals industries and consults internationally.

Dr John Grandfield, BSc (RMIT) Msc (Monash) PhD (University of Queensland)

John Grandfield is director of Grandfield Technology Pty Ltd, a consulting and technology firm. John has 25 years experience in light metals cost house research in industry and government laboratories (Rio Tinto Alcan, CASTcrc and CSIRO). He has published extensively on DC casting with particular reference to cracking and water cooling control. His work on remelt ingot casting process improvement has been awarded internationally.

Dr. Barry Sadler, BSC (RMIT) PhD (University of Queensland)

Barry Sadler has been involved in the Aluminium Industry for more than 25 years with a focus on anode carbon technology. His career commenced at Comalco (Now Rio Tinto Alcan) in 1982 through to 2002 when he set up the independent consultancy - “Net Carbon Consulting Pty Ltd”. He provides advice, training and support to clients on improving carbon plant performance and process technology, focussing on the application of statistical thinking and methods to process management.

A Word from Participants

I now have a better understanding of the fundamentals (thermodynamics, chemistry) of the reduction process, which is a good complement to my practical experience. I frequently refer to the course notes when explaining issues to colleagues.
Mark Cooksey, Research Program Leader, CSIRO, Australia

I learned a new approach to look into the data and presenting them in such a way that they are readable and easy to analyse. It also widened and corrected my understanding about alumina, its specifications and impact on pot operation.
Mohsin Ahmed Shukralla, Reduction Manager, Aluminium Bahrain B.S.C.

The cross-section and also "pedigree" of faculty was excellent and certainly brings the content to life and gives it crucial relevancy.
Stewart Hamilton, Manager, Technology and Sustainability, NZAS.

During the last 10 years I attended quite some courses for the aluminium industry all over the world. Under all these courses the Certificate and Diploma courses organised by the Universities of Auckland and NSW offers the best in class training for supervisors, engineers and researchers.
Dr. Martin Iffert, General Manager, Trimet, Essen.

How to enrol ?

> Key Dates 2010
Expression of interest – by 4th July 2010
Residential 3 week block – 24th November to 15th December
Residential block will be held in Bahrain and with onsite smelter visits to ALBA.

> Contact
Pretesh Patel p.patel@auckland.ac.nz
Margaret Hyland m.hyland@auckland.ac.nz

> Cost
Standard applicable University enrolment fees apply. Depending on the conversion rate as below:
- Course Fees ~ NZ$13,000 approximately US$9,500
- Social fee ~ NZ$1,500 approximately US$1,100
- Travel and accommodation not included. (General guides and information are available on the LMRC website www.lightmetals.co.nz)

For further information on the course, admission and Engineering Postgraduate programmes please visit
www.lightmetals.co.nz

THE UNIVERSITY OF AUCKLAND
NEW ZEALAND
Te Whare Wānanga o Tāmaki Makaurau

LIGHT METALS RESEARCH CENTRE · THE UNIVERSITY OF AUCKLAND ·

University Postgraduate Qualification in Aluminium Reduction Technology

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LIGHT METALS RESEARCH CENTRE · THE UNIVERSITY OF AUCKLAND ·

2010

> **Residential 3 week block**
24th November to 15th December 2010
Held at Aluminium Bahrain (ALBA)

Post Graduate Certificate in Light Metals Reduction Technology

Goals of the programme

The aim of the programme is to teach advanced concepts in chemical and materials engineering specific to light metals reduction technology, especially aluminium. The course content draws on recent advances in technology and leading edge research and uses experts from academia and industry as lecturers and tutors.

What is the Qualification?

- The Certificate is a series of University Courses integrating all key aspects of smelting technology. It is a key qualification for running smelters.
- This knowledge is applied to real smelting projects, tailored to the needs of the class. Intensive problem solving leads to new insights about your own operation, and your ability to put them into practice.

How does it differ from Industry Courses?

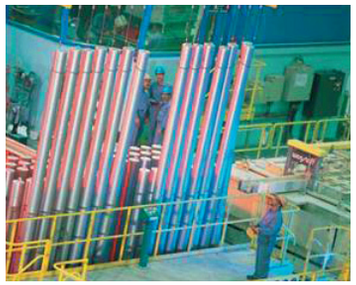
- The Certificate has restricted class size, allowing intensive learning, interaction and plenty of humour.
- Pre-course and post-course assignments contribute to assessment and detailed feedback is provided on these.
- A significant period is spent on site at aluminium smelters, applying the theory to smelting practice.
- World Experts present key lectures in each area of the technology.

How do I take the Certificate if I work full-time?

- The Certificate is designed for you.
- You complete assignments during a three month period, at your home.
- You also attend a 3 week intensive residential block in Bahrain (Middle East).

What doors does it open?

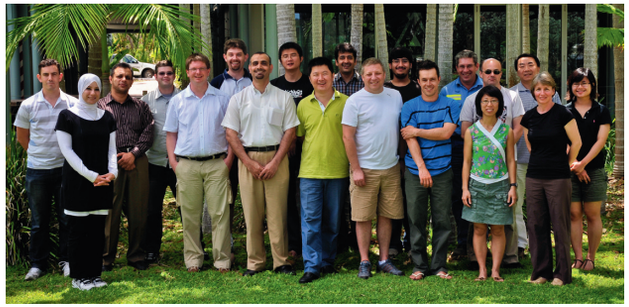
- A new, international family of smelter specialists who share their learning. You will become known around the smelting world.
- Relationships with leading academics and consultants to the industry, for you to draw on later.
- A springboard for a Diploma or a Master of Engineering – designed to address a plant-oriented problem of importance to you.



Teaching/delivery methods

A majority of students work in the Light Metals industry, will have a practical knowledge of one aspect of reduction technology, and will be based outside of New Zealand. Several features of the course delivery have been designed in recognition of this:

- The Postgraduate Certificate will be run as three sections, the first and last sections being extramural, the second being a 3-week, on-site taught unit:
  1. Section 1 – Review & Fundamentals Assignments (extramural);
  2. Section 2 – On-site lectures, tutorials, site visits;
  3. Section 3 – Advanced Topics, projects/assignments (extramural).
- In Section 2, lectures are interspersed with tutorials, group and plant work to allow students to practice techniques and concepts covered.
- The lecturing is done by specialists from academia and industry.
- Practicable, extramural assignments and projects in Section 3 are tailored to specific technical issues of interest to the student(s).



Class of 2008

General Content Overview

The course covers the complete process of aluminium production from raw materials to final product, with a practical and plant-based focus. The fundamental theories governing the process are covered, including cell electrochemistry and heat transfer, leading to practical operation of an industrial cell and smelter. This includes cell design and life, smelter control and plant measurements, work practices and safety considerations. World-best practices are discussed for all processes and plant areas.

Processing and properties of smelter grade alumina are covered extensively, including their effects on impurities, feeding and dissolution processes in an industrial cell. Cell materials are examined, focussing mainly on the production, properties and quality of carbon anodes and cathodes and their consumption and performance in the cell.

The full range of processes and operational considerations present at an industrial smelter are covered through the course, with both fundamental and practical consideration by experts in the field. There is a strong focus on safety and environmental performance, as well as supporting areas such as plant economics, alternative and future processes, and discussion of the world aluminium industry and trends.

Fundamentals of Aluminium Production

- Process overview, mass and energy balance, heat transfer fundamentals, electrolytes and additives, cell voltage, magneto-hydrodynamics

Alumina

- Production process, smelter grade alumina – structure and properties, quality and impurity transport, practical smelter implications, dissolution and feed control

Cell Design

- Design objectives, life cycle performance and autopsy analysis, materials design and performance – sidewall, cathode lining etc

Operational Practices

- Anode changing, metal tapping, anode covering best practice and work practice safety

Control

- Basics of smelter control, principles of temperature and AlF3 control, measurements processes, their reliability and reproducibility, advanced process control

Anodes

- Carbon materials theory, carbon processing in smelters (including rodding), anode performance

Environmental Control and Emissions

- Greenhouse gas emissions, fluoride emissions and return of fluoride to cell, minimising emissions, dry scrubbing fundamentals

Casthouse

- Operational processes and safety, product types, equipment and economics

For more details regarding the course please visit www.lightmetals.co.nz