NCP Information Session
School of Mechanical and Mining Engineering

Nicholle Elford

Friday 23 February 2024
Contact details

studentenquiries@mechmining.uq.edu.au

Level 4, Mansergh Shaw (45)

Tel: 07 3365 3668
Prior to Applying

☑ Familiarise yourself with the information, available on the School Website for details on:

- Eligibility and selection criteria.
- Travel dates and indicative costs.

☑ Check you have elective space in your program for MECH4950 – we recommend contacting The EAIT Faculty for a progression check.

☑ Check you have a valid Australian Passport (more than 6 months validity).
Mobility Grant

Successful applicants will receive a $3000AUD mobility grant that can be used towards trip costs including:

- Kyushu program Fee (*The program fee is stipulated by Kyushu University*).
- Flights & Accommodation.
- Meals & local transport costs during the program.

Please note: The University of Queensland will pay the Program fee in a lump sum to secure a cheaper price. *Students will receive the remaining funds.*

Students may not receive the mobility grant prior to booking of flights.

Students are required to self-fund any additional costs beyond the mobility grant amount.
How to Apply

Complete the online application form available on the School Website.

More Info/Apply:

Applications close at 10:00am on Monday, 11 March 2024.
Agenda for MECH4950 information seminar on Friday 23rd Feb 2024@ 46-442

10:00 Overview and past experiences of MECH4950 (Prof. Kazuhiro Nogita)
10:30 Student Perspective of MECH4950 (TBD)
10:40 Administrative info (Ms Nicholle Elford)
10:50 Q&A
New Colombo Plan Mobility Program 2024

Hydrogen Energy in Australia and Japan
- Industry Opportunities for Australia's Future Engineers -

22 students to participate in the short-term mobility program to Japan (27th June to 16th July 2024).
Project Aims

• To provide an opportunity for 22 UQ Engineering students
• The project will consist of 20 days stay.
• The project will involve on-site exchange to Kyushu University (KU) and the delivery of two series of lectures.
• Lecture topics will include Advanced Engineering Technologies with a focus on the Japanese Manufacturing Sector and Japanese Language.
• The Kyushu Economic Federation (KEF) and Fukuoka Strategy Conference for Hydrogen Energy (FSCHE) will facilitate industry involvement and the participation of manufacturing facilities (Nippon Steel, Kyushu Electric Power Co, Namura Shipbuilding Co., HyTReC, J-POWER etc.).
MECH4950 in 2024
(Advanced Manufacturing in Practice)

Professor Kazuhiro Nogita
Email k.nogita@uq.edu.au
Work Phone 0733653919
Office Location Office 644, Advanced Engineering Bldg, 49 Jocks Rd, St. Lucia, Brisbane, QLD 4072 Australia
Office Hours 24hours/7days (by e-mail). During tour to Japan
Notes
http://researchers.uq.edu.au/researcher/653

Dr Xin Tan
Email xin.tan@uq.edu.au
Work Phone +81-92-802-3488 (daytime), +81-080-9981-3084 (sms)
Office Location Room 814, West Building 2, Kyushu University, Motooka 744, Nishi-ku, Fukuoka 819-0395, JAPAN
Office Hours 24hours/7days (by e-mail and sms), during tour in Japan
Personal Link https://researchers.uq.edu.au/researcher/28208

Nicholle Elford
Administrative Officer
School of Mechanical and Mining Engineering
The University of Queensland
Brisbane Qld 4072 Australia

E-mail: studentenquiries@mechmining.uq.edu.au
<table>
<thead>
<tr>
<th>Date</th>
<th>Activity</th>
<th>Learning Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>19 May 23 16:00 - 19 May 23 17:00</td>
<td>Predeparture seminar 1 (Seminar): Guidance for Advanced Engineering: Sustainable Energy for a Better Future (10% assessment)</td>
<td>1</td>
</tr>
<tr>
<td>25 May 23 17:40 - 25 May 23 19:10</td>
<td>Orientation for online lecture series (Lecture): Advanced Engineering: Sustainable Energy for a Better Future</td>
<td>1</td>
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<tr>
<td>01 Jun 23 17:40 - 01 Jun 23 19:10</td>
<td>Lecture 1 for online lecture series (Lecture): Advanced Engineering: Sustainable Energy for a Better Future</td>
<td>1, 2, 3</td>
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<tr>
<td>02 Jun 23 10:00 - 02 Jun 23 11:00</td>
<td>Predeparture seminar 2 (Seminar): Final predeparture seminar with business card provided.</td>
<td>1</td>
</tr>
<tr>
<td>08 Jun 23 17:40 - 08 Jun 23 19:10</td>
<td>Lecture 2 for online lecture series (Lecture): Advanced Engineering: Sustainable Energy for a Better Future</td>
<td>1, 2, 3</td>
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<tr>
<td>15 Jun 23 17:40 - 15 Jun 23 19:10</td>
<td>Lecture 3 for online lecture series (Lecture): Advanced Engineering: Sustainable Energy for a Better Future</td>
<td>1, 2, 3</td>
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<tr>
<td>22 Jun 23 17:40 - 22 Jun 23 19:10</td>
<td>Lecture 4 for online lecture series (Lecture): Advanced Engineering: Sustainable Energy for a Better Future</td>
<td>1, 2, 3</td>
</tr>
<tr>
<td>29 Jun 23 8:40 - 16 Jul 23 10:00</td>
<td>Kyushu Uni (Fukuoka) (International workshop and tour): The full schedule will be available on Blackboard. Readings/Ref: Blackboard; Blackboard</td>
<td>1, 2, 3</td>
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<tr>
<td>06 Jul 23 17:40 - 06 Jul 23 19:10</td>
<td>Group presentation (Workshop): Advanced Engineering: Sustainable Energy for a Better Future</td>
<td>1, 2, 3</td>
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</table>
MECH4950 in 2023
(Advanced Manufacturing in Practice)

<table>
<thead>
<tr>
<th>Assessment Task</th>
<th>Due Date</th>
<th>Weighting</th>
<th>Learning Objectives</th>
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<tbody>
<tr>
<td>Report</td>
<td>4:00pm on Thursday 27 July 2023</td>
<td>60%</td>
<td>1, 2, 3</td>
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<tr>
<td>Final Report</td>
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<tr>
<td>Presentation</td>
<td>5:00pm - 6:20pm Friday 14 July 2023</td>
<td>30%</td>
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<tr>
<td>Summary Presentation</td>
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<tr>
<td>Attendance</td>
<td>18 May 23 17:40 - 16 Jul 23 10:00</td>
<td>10%</td>
<td>1, 2, 3</td>
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<tr>
<td>Sustainable Energy for a Better Future</td>
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+ Group Presentation @ KU, and essay for NCP (1-2 pages with photos)
**Presentation Assessment Sheet (MECH4950)**

<table>
<thead>
<tr>
<th>Group</th>
<th>Group Members</th>
<th>Total (100)</th>
<th>Depth of analysis and demonstration of key concepts and ideas (50)</th>
<th>Structure and timing (15)</th>
<th>Presentation (voice, professionalism, audio-visual, mannerisms) (15)</th>
<th>Handling of questions demonstrates a depth of knowledge (20)</th>
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Assessor’s name:  
Signature:
# Mark sheet: MECH4950 report (Page 1)

<table>
<thead>
<tr>
<th>Grade Band</th>
<th>Definition and scope (10%)</th>
<th>Background (20%)</th>
<th>Evaluation of Manufacturing in Japan and Academic and Professional Engineering Practice (50%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Excellent</strong> (85-100%)</td>
<td>Excellent, clear definition of the topic and scope. A suitable abstract that accurately yet concisely captures the topic and outcomes of the NCP travel.</td>
<td>Extensive, relevant and logically organised review, analysis, discussion of background material. Both specific research and general theory, helps the reader understand the rest of the document. Demonstrates clear mastery of the material in the topic area and ability to synthesize and abstract knowledge.</td>
<td>Excellent synthesis of background material and ideas and learning that occurred during the NCP travel to evaluate the key concepts outlined in the learning objectives. There is a clear depth to the report that demonstrates the creation and/or comparison of ideas in a concise fashion.</td>
</tr>
<tr>
<td><strong>Very Good</strong> (75-84%)</td>
<td>Very good definition of the topic and scope. The abstract accurately captures the topic, and outcomes of the NCP travel.</td>
<td>Relevant and logically organised review, analysis, discussion of background material. Both specific research and general theory, helps the reader understand the rest of the document. Demonstrates mastery of the material in the topic area and ability to synthesize and abstract knowledge.</td>
<td>Very good synthesis of background material and ideas and learning that occurred during the NCP travel to evaluate the key concepts outlined in the learning objectives. There is a depth to the report that demonstrates the creation and/or comparison of ideas.</td>
</tr>
<tr>
<td><strong>Good</strong> (65-74%)</td>
<td>Good definition of the topic and scope. The abstract captures the topic and outcomes of the NCP travel.</td>
<td>Good review/discussion of background material. Both specific research and general theory are presented. Shows good understanding of the material in the topic area and ability to synthesize and abstract knowledge.</td>
<td>A good synthesis of background material and ideas and learning that occurred during the NCP travel to evaluate the key concepts outlined in the learning objectives. There is some depth to the report that demonstrates the creation and/or comparison of ideas.</td>
</tr>
<tr>
<td><strong>Satisfactory</strong> (50-64%)</td>
<td>Satisfactory definition of topic and scope. The abstract satisfactorily captures the topic and outcomes of the NCP travel.</td>
<td>Acceptable coverage of background material. Both specific research and general theory are presented. Shows basic understanding of the material in the topic area.</td>
<td>A satisfactory synthesis of background material and ideas and learning that occurred during the NCP travel to evaluate the key concepts outlined in the learning objectives.</td>
</tr>
<tr>
<td><strong>Poor</strong> (25-49%)</td>
<td>Poor or incomplete definition of topic and scope. The abstract is not clear about the topic and the outcomes of the NCP travel.</td>
<td>A limited coverage of background material, which perhaps does not cover both specific research and general theory. Flaws in the basic understanding of the material in the topic area are evident.</td>
<td>A poor attempt has been made at synthesising the background material and ideas and learning that occurred during the NCP travel to evaluate the key concepts outlined in the learning objectives. The report is more a chronological account of the trip with little evidence that new ideas were considered/generared.</td>
</tr>
<tr>
<td><strong>Very Poor</strong> (0-24%)</td>
<td>Topic and scope are very unclear. The abstract does not summarise the report topic and outcomes or there is no abstract.</td>
<td>An extremely limited coverage of background material is included. There is an apparent lack of understanding of the material in the topic area.</td>
<td>Limited or no connection is evident between the background material and ideas and learning that occurred during the NCP travel to evaluate the key concepts outlined in the learning objectives.</td>
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NCP 2017-2023
## MECH4950 in 2022
(Advanced Manufacturing in Practice)

<table>
<thead>
<tr>
<th>2022 UQ-JPIE (Japan Program for Industry Experience) Tentative</th>
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<td>16:40-18:10</td>
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**ERC: Engineering Course**
- World-Testing Research
- Hydrogen, Wind, Nuclear Energy
- Japanese Industries
- JBC: Japanese Business Communication
- Plenary Lecture

**Free time**
- Transport to Fukusuka airport

**Tentative**
Largest, Newest Campus in Japan
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Construction to be completed in 2018

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Kyushu University Shodo club
Kyushu University Tea Ceremony Club
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OPERA

Prof. Chihaya Adachi
World-leading Research
The Ultramicroscopy Research Center

Prof. Kazuhiro Yasuda
World-leading Research
I2CNER

Prof. Stephen M. Lyth
World-leading Research
Recent study on the Space Transportation System

Prof. Hideaki Ogawa
Mr Jackson Geritz (UQ Racing Team) with Hydrogen
An ideal launch pad into the hydrogen energy sector

The Hydrogen Testing and Research Center (HyTReC) offers cutting-edge hydrogen testing facilities for scientific research, prototyping, and full product testing. Established under the auspices of Fukuoka Prefecture, HyTReC is an independent nonprofit organization that supports new hydrogen energy businesses and serves as a launch pad for hydrogen technologies and products they develop. Hydrogen system components such as valves, sensors, hoses, and cylinders in vehicular or stationary applications, including hydrogen stations, can be tested and qualified at HyTReC for R&D and commercialization.

HyTReC (The Hydrogen Testing and Research Center)

Genkai Nuclear Power Station (Genkai Energy Park)

https://www.kyuden.co.jp/english_index.html
Genkai Nuclear Power Station (Genkai Energy Park)

https://www.kyuden.co.jp/english_index.html
Genkai Nuclear Power Station (Genkai Energy Park)

https://www.kyuden.co.jp/english_index.html
Namura Shipbuilding Co.

Industries in North Kyushu Island

Becoming the Best Steelmaker with World-Leading Capabilities

NSSMC has adopted a new medium-term business plan, covering fiscal 2018 to 2020. By improving the company’s “technology,” “cost,” and “being global” characteristics, NSSMC is determined to prevail in the increasingly competitive market. The company has every intention of becoming the unrivaled Best Steelmaker.
Visit by Marquis Ito (Hirofumi) in 1900

Chronology of Yawata Works

1896 Government announced decision to build iron and steel works in Yawata (March 29)
1897 A Yawata Steel Works office was opened in Yahata Village, Onga-gun, Fukuoka Prefecture. (June 1)
1901 The state-owned Yawata Steel Works began operation.
Higashida blast furnace was blown in. (Feb. 5)
Operation of a rail & shape mill started. (Nov. 16)
The start ceremony of operation was held. (Nov. 18)
1930 Kukioka blast furnace was blown in. (June 17)
1934 Japan Iron & Steel Co., Ltd was founded due to consolidation of iron & steel companies
(six companies including Yawata Steel Works). (Feb. 1)
1950 Japan Iron & Steel Co., Ltd was divided into four companies by the Law for the Elimination of Excessive Concentrations of Economic Power; Yawata Iron & Steel Co., Ltd. was formed. (April 1)
1959 Tobata blast furnace was blown in. (Sept. 1)
1970 Nippon Steel Corporation was formed. (March 31)
1988 Shift to the new production system
(One-blast furnace operation, receipt of semi-finished products lotted out, etc.)
1998 No. 4 blast furnace began operation in place of No. 1.
(No. 1 blast furnace closed.)
2002 Waste Plastics Recycling Facility began operation. (April 1)
2003 Integration of stainless steel business with Sumitomo Metal Industries (launching of Nippon Steel & Sumikin Stainless Steel Corporation (NSSC))
Rolling

Treatment and processing
Receipt of raw materials

Conditions of raw materials As of 2015
Volume of iron ore and coking coal purchased (Unit: 10,000 ton)

What are needed to produce one ton of iron?
- Iron ore ........................................ 1.6 tons
- Coke ........................................... 0.5 ton
- Limestone ..................................... 0.1 ton
- Others ........................................ 0.08 ton
- Total ........................................... 2.2 tons

Iron usage in various structures/products
- Tomei Expressway ......................... 550,000 tons
- New Tokyo International Airport .... 400,000 tons
- Tokyo Sky Tree .............................. 40,000 tons
- Kanmon Bridge .............................. 30,000 tons
- Wakato Bridge ............................... 28,000 tons
- Tokyo Dome ................................ 2,600 tons
- Automobile ................................. 900 kg
- Refrigerator ................................ 25 kg

Number of employees (as of March 2016)
- Yawata Works .............................. 4,200 people

Size of Yawata Works
- Equivalent to 237 times the Tokyo Dome
- Equivalent to 158 times the Fukuoka Yafuoku! Dome

Water usage quantity (as of 2015)
- Daily basis ................................. 3.06 million tons
  *Return water recovery rate ....... 90%
BUSH LIFE
by
HIROSHI OKANO

THE STORY OF THE DISCOVERY OF THE HARD COKING COAL AT MOURA, CENTRAL QUEENSLAND, AUSTRALIA.
BUSH LIFE
by
HIROSHI OKANO
THE STORY OF THE DISCOVERY OF THE HARD COKING COAL AT MOURA, CENTRL QUEENSLAND, AUSTRALIA.
Frederick Whitehouse attended Ipswich Grammar School, and went on to study at the University of Queensland. He graduated with a B.Sc., with first-class Honours in geology and mineralogy from the University of Queensland in 1922, and a government gold medal for outstanding merit. He and fellow student Dorothy Hill, had collected many fossils during their studies at UQ, which had advanced their individual and shared research in the field.

Whitehouse was Associate Professor of Geology, University of Queensland (1949-1955). Whitehouse resigned from the University in 1955. He continued to work as a geological consultant for many oil companies from 1955, and was president of the Anthropological Society of Queensland from 1972 to 1973.

Whitehouse was a close friend of Dr James O'Neil Mayne (1861-1939), who with his sister Mary Emelia Mayne purchased land in St Lucia in 1926, which was to become the new site of the University of Queensland.
モウラ炭鉱開坑時（1961年4月）
(DW)-(DW) ドウソン・ハイウェイ (W) ワードルの家
(WA) 現在ここに選炭工場あり (MT. W) ワイズマン山
(B) この辺一帯はビショップの所有の牧場で羊が群れていた。

Moura Mine at the beginning (Apr., 1961)
(DW) - (DW) Dawson Highway (W) Mr. Wardle's house
(WA) Washery at present (MT. W) Mt. Wiseman
(B) Around here was the meadow of Mr. Bishop's property
and sheep were grazing here once.
Coal production from Moura mine

Production (t)

<table>
<thead>
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<th>Year</th>
<th>Production (t)</th>
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<tbody>
<tr>
<td>1959</td>
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<tr>
<td>1960</td>
<td>1000000</td>
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<td>1500000</td>
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<tr>
<td>1968</td>
<td>5000000</td>
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<tr>
<td>1969</td>
<td>5500000</td>
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</table>
Kouzan Chishitsu,
15 (1965) 234-244.

Exploration and Exploitation of Hard Coking Coal in Kianga-Moura Field,
Central Queensland, Australia.

by
Hideo KIKUCHI, Masatoshi TSUTSUMI, Hiroshi OKANO, Tadashi SAKAMOTO
and Atsuo AIHARA

(Abstract)

Owing to a very limited amount of hard coking coal production in Japan, Japanese have been constantly seeking nearer and adequate supply source for that kind of coals. They have been producing hard cokes by blending domestic soft coking coals with which American coals were dominant until 1955 or so.

In order to fulfill these demands and upon request of the Mitsui & Co., Ltd., attention and made studies of the Kianga-Moura Field in Central Queensland, Australia. Our first field survey from January to April, 1959, we gained the following knowledge and conclusion as mentioned below.

(1) In Baralaba, the northern extremity of this field, occurrence of anthracite has been reported since then the mines were opened. Many prospecting works were carried out to find geological features of coal seams in and around the area. The results revealed that there is no anthracite or anthracite containing 10% or less volatile matter, and that the strata are contorted with NW-SE faults and folds.

(2) In Kianga, southern sector of the field, the Thiess Bros. (Qld.) Pty., Ltd., has located a coal seam in box-cut after prospecting by drillings. Coal is soft coking coal with 34% volatile matter. The coal seam has a gentle westward dip of 6-8 degrees.

(3) Judging from the geological features of the above two areas, the coal seams are assumed to occur in the same horizon or nearly in the same horizon.

(4) The difference in coal quality between Baralaba and Kianga is thought to be caused by the tectonic movement by which the complicated structure of the Baralaba area was formed.

(5) The above-mentioned geological assumption leads to a conclusion that medium to high volatile quality coal with a possibility of hard coking coal, may be concealed underneath the vast unexplored area between Baralaba and Kianga, covering a distance of 60 km.

From the said point of view, the second prospecting work was commenced in June 1959 for hard coking coal required by the Japanese Steel Mills, with the cooperation of the Mintex Corporation. The results revealed that our geological conjecture was right.
Regional Variation in Rank of Coal in the Great Syncline Coalfield, Queensland, Australia

by Hiroshi Okano and Atsuo Aihara
(Mitsui Mining Company)

SYNOPSIS:—A regional variation of coal quality was recognized within the course of writers’ 1959～1960 prospecting work for hard coking Coal at Kianga-Moura area in the Great Syncline Coalfield (Bowen Basin), and some upper Bowen coals in the central part of the basin are dealt with.

The higher rank (higher C content) coals are plotted on the part of lower value in a coal band of the H/C versus O/C diagram (Fig. 4) reproduced from analytical data of localities (tab. 1). Distances between coal localities and western limit line of the “Dawson Tectonic Zone,” a striking folding and faulting zone in the south-eastern part of the basin, connecting Banana and Bluff via Baralaba and the tectonic zone and regional rank variation is recognized higher the rank. From a geological view point of mine, the central part of the basin with local exception is not an effective point to the rank variation is negligible in general. The depth of burial (that has important concern to the rank variation) is limited at the base of Clematis Sandstone according Taurus, Baralaba and Moura do not correspond with the depositional facies of coal seams and thickness and minerallity that the coals near or in the zone were buried in deep beds, an anomalous case, and the thickness of burial might have the regional variation of rank.

As a conclusion, most important role had been played of the basin from the beginning and migration of centre of the Dawson tectonic movement; the increase of deeper burial of coal seams and added heat and stress pressure that occurred during the formation of the mine would be effective functions in the course of coalification.
Yamakasa festival on 1\textsuperscript{st}-15\textsuperscript{th} July