

Professional Training Course in New Caledonia, Mining and Metallurgy

Formation professionnelle aux métiers de la mine et de la Métallurgie.

Prof. Christian Picard -University of New Caledonia



PECC

Pacific Economic Cooperation Council

Mineral Network

Noumea 6-7 november 2002



Université
de la
Nouvelle-Calédonie

The University of New Caledonia (U.N.C.) was created through a decree adopted on May 31, 1999.

Formerly, it was a component of the French University of the Pacific but has now turned into a full-fledged university.

It is a public institution with a scientific, cultural and professional mission and is, like all French universities, governed by the law of January 26, 1984, subject to the adjustments brought by the edict of July 8, 1998.

Its main mission includes:

- education and continuing education
- the development and publication of research (in science, law and humanities)
- the dissemination of culture
- scientific and technological information
- International cooperation

U.N.C. consists of 3 Departments which dispense education and continuing education :

- Department of Law (law, economics, management)
- Department of Arts (literature, languages and social sciences)
- Department of Sciences (science and technology)

5 Research units (Equipes d'accueil - EA) including 8 laboratories are actually recognized by the French Research Ministry :

EA 3325 : Geoscience and Physics Laboratory (Laboratoire des Géosciences et Physique de la Matière Condensée - LGPMC) : *Transfer and Speciation of Nickel from the Massif du Sud ophiolite to the lagoon.*

EA 3326 including 3 laboratories:

- Vegetal Biology and Physiology Laboratory (Laboratoire de Biologie et Physiologie Végétales Appliquées - LBPVA) : *Study, Preservation and development of ecosystems.*
- Marine Environmental and life resources Laboratory (Laboratoire d'Etudes des Ressources Vivantes et de l'Environnement Marin - LERVEM) : *Dynamic and Ecology of lagoon fishes.*
- Laboratory of Natural substances in Pharmacochimistry (Laboratoire de Pharmacochimie des Substances Naturelles - LPSN).

EA 3327 : Transcultures : *Cultural and Spatial recomposition in the South Pacific.*

EA 3328 : Anthropology : *Identity, Orality in the Insular Pacific.*

EA 3329 : Law Research

The staff is composed of :

- 60 lecturers and researchers
- 40 administrative and library officers.

Approximately 2000 students are registered at U.N.C in 2002.

Academic Training mainly offers :

- Bac + 2 level : DEUG (Diplom for General Studies in University)
and DEUST (Diplom for Scientific and Tecnichal Studies in University)
- Bac + 3 level : LICENCE
- Bac + 4 : Maîtrise, only for law studies
- Bac + 5 : DEA (Diplom for High grade Studies) for Anthropology studies
- Bac + 8 : PhD

Department of Arts : literature, languages and social sciences Département Lettres, Langues et Sciences Humaines

First academic cycle : Bac + 2

DEUG in Modern Literature

DEUG of English

DEUG in Regional Languages and Cultures

DEUG of Geography

DEUG of History

Second academic cycle : Bac +3

Licence in Modern Literature

Licence of English

Licence in Regional Languages and Cultures

Licence of Geography

Licence of History

Third academic cycle : Bac +5

DEA »Societies and Cultures in the Insular Pacific : Dynamic and Transformation »

Department of Law : law, economics, management
Département Droit, Economie et Gestion

First academic cycle : Bac +2

DEUG AES (Administration and Economical Sciences)

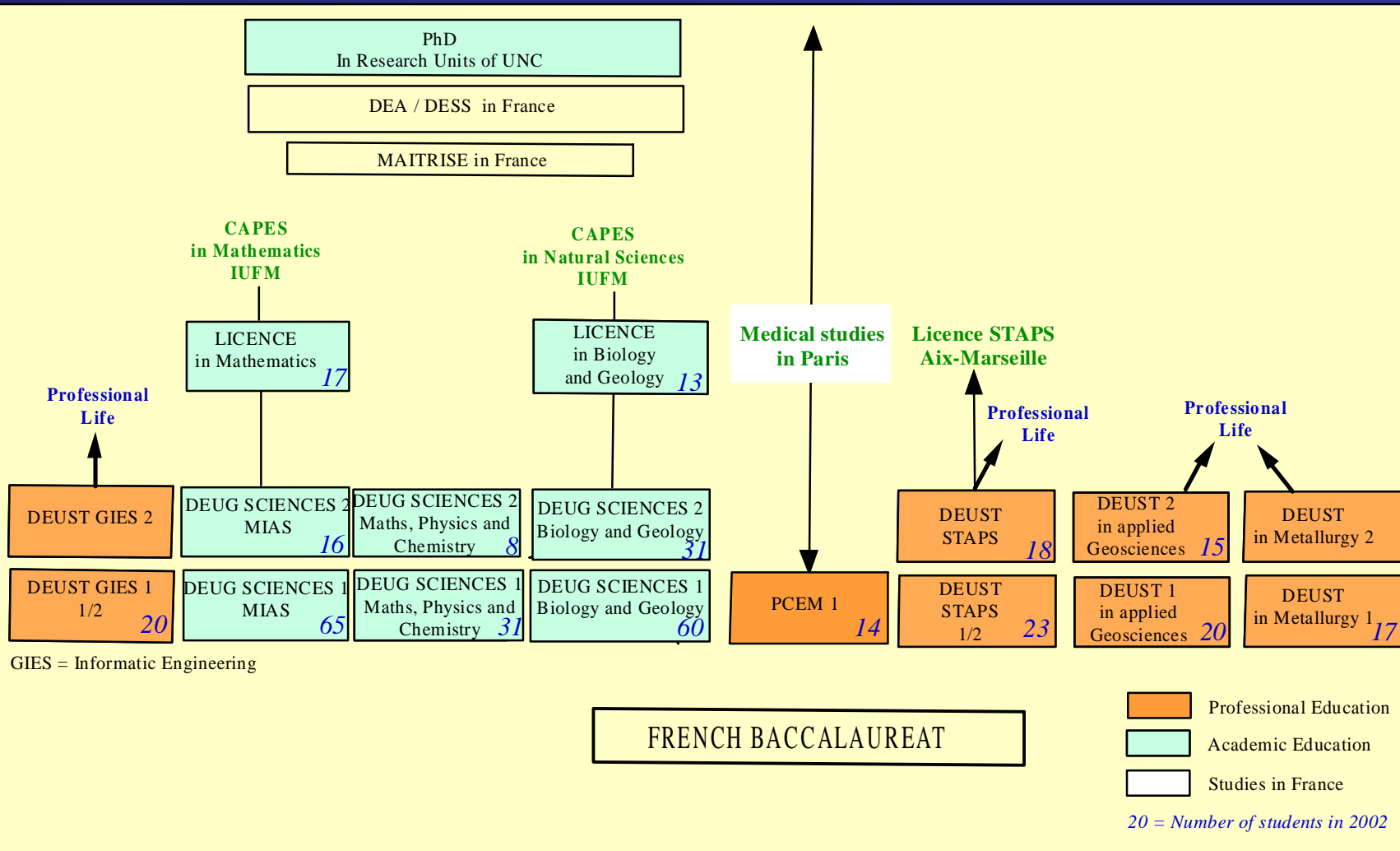
DEUG in Law

Second academic cycle : Bac + 3 and + 4

Licence in Law

Maîtrise in Public Law

Department of Science : Sciences and Technology



Geosciences Formation and Research in UNC

Geosciences Professional education: a priority for UNC

- **DEUST in Geosciences : Water, Mines and Environment**
- **DEUST in Metallurgy and Metallurgical Engineering**

Geosciences Formation supported by Research activities in LGPMC

- **Evolution of the SW Pacific from New Caledonia to New Zealand – Geodynamic and petrologic processes**
- **Ni and PGE distribution in ophiolitic sequences and supergen alterites**
- **Physical characterization of fine nickel particules**
- **Sedimentation and solid transfer in littoral and lagoon environments.**

DEUST in GEOSCIENCES : Water, Mines and Environment

The DEUST in Applied Geosciences (Mines, Water and Environment) is an evolution of the DEUST Mines created in 1989 in New Caledonia in relation with Le Nickel Society to develop Bac+2 Professional training and to produce Technicians on Nickel Mines.

Today, it trains technicians for the different companies which develop Geological and mining activities in New Caledonia (SLN, SMSP, INCO, FALCONBRIGE...) and for local collectivities or technical services in water resources, environmental sciences.

Nearly 100% of the students find jobs in mining industry and local collectivities.

DEUST in Metallurgy

The DEUST in Metallurgy opened for the first time in february 2002.

It has been created in relation with the development of the new mining projects in the south by GORO NICKEL Society and in northern New Caledonia by FALCONBRIDGE-SMSP for the Koniambo project.

It will produce the first generations of technicians in Metallurgy in February 2004.

SLN, GORO NICKEL, and SMSP-FALCONBRIDGE directly help the development of these two formations by financial supports and human contributions.

Emplacement of short professional formations (Bac +2) is very well adapted to the requests of the economic and politic operators in New Caledonia.

DEUST in GEOSCIENCES : Water, Mines and Environment

DEUST in Metallurgy

DEUST in Geosciences and Metallurgy are opened every year.

20 students are selected for each formation by a committee depending on their results at Scientific Baccalauréat and their motivation.

Trainings are given in UNC for two years. They include lectures, practical work and practical activities on field and mines between February and October.

They are completed by two vocational training courses in industry : 4 weeks at the end of the first year, 6 weeks at the end of the second year.

Theoric and practical lectures are given by the academic staff of the university (Professors and Maître de Conférences) for 60%, and by professional staff coming from Industry (SLN, GORO-Nickel, SMSP-FALCONBRIDGE) and local collectivities or local societies for 40% of the formation.

Each Level of the formation is validated by a theoric and practical exam.

Vocational training courses are sanctioned by a report and an oral defence.

DEUST in GEOSCIENCES : Water, Mines and Environment

For the DEUST in Geosciences, admission to the exams varies between 45 and 60% at the issue of the first year, 90 to 100% at the end of the second year.

Consequently around 12 new technicians are every year ready to be employed. This number seems to be accurate to the needs of the industry. Hence around 100% of our students quickly find a job a few weeks after the end of their formation.

Around 120 students have obtained their DEUST from its opening in 1989, most of them are now technicians in the different mining societies of New Caledonia.

Every year, several of the students decide to continue their training in French universities. This is possible for the best students, or students with several years of professional experience.

For example, some are admitted in engineering schools in Nancy, in Earth Science Licence, MST (Maîtrise for Sciences and Technics : Bac + 4) and DESS (Bac+5) in French universities.

D.E.U.S.T. in Metallurgy

The aimed employments are those of Metallurgy

- technicians in metallurgy
- technicians in engineering processes
- technicians in testing quality

Potential firms are :

- Goro Nickel
- Falconbride – SMSP (Koniambo project)
- Société Le Nickel

More than 100 jobs in these fields are promised to be given for the 5 next years.

DEUST in GEOSCIENCES : Water, Mines and Environment

DEUST in Metallurgy

Initially opened for a few years, the DEUST in Geosciences has existed for 13 years. It should be maintained for the next three years.

DEUST in Metallurgy should normally have the same success.

In the future, these DEUST should be transformed in a **PROFESSIONNAL LICENCE** in response to the evolution of the french educative system to the mode 3 – 5 – 8

3 : LICENCE Level

5 : MASTER Level (equivalent to present DESS or DEA)

8 : PhD Level

This will be doen for a better adequation with European and Anglo-saxon education systems.

DEUST in GEOSCIENCES : Water, Mines and Environment

1st academic year : 635 h

- + Mathematics.
- + Probabilities and statistics.
- + Data processing applied to the mining activity.
- + Chemistry
- + Applied Physics.
- + General Geology and Geology of Mineral Resources
- + Initiation to geological mapping : Field geology (2 days of training).
- + Topography 1
- + Geotechnic Methods 1.
- + Management and Protection of the environment.
- + Enterprise management and Administration.
- + Working and Mining Law
- + Communicating technics
- + English.
- + Professional training in Industry (4 weeks).

DEUST in GEOSCIENCES : Water, Mines and Environment

2nd academic year : 636 h

- + Mineral Chemistry.
- + Applied Mineralogy
- + Sedimentology
- + Structural Geology.
- + Geology and Mineral Resources from New Caledonia : 1 field-trip 4 days.
- + Data processing 3 - 4. (CAO-DAO, AUTOCAD...).
- + Photo-interpretation; Teledetection : (SPOT systems), SIG : MAPINFO.
- + Topography 2 - Initiation to G.P.S. (Global Positionning System).
- + Methods of Geophysic 2.
- + Drilling technics and Mining Prospection
- + Technics for Mining Operation
- + Sampling Technics - Ore-minerals valorisation
- + Hydrogeology
- + Geotechnic 2
- + Sea-shore Geology.
- + Management and Protection of the environment 2.
- + Professional training in industry (6 weeks).

DEUST in Metallurgy

1st academic year : around 600 h

Mathematics

Probabilities and statistics

Computer Sciences

General Chemistry 1

Thermodynamic and thermic systems

Fluids and solid mechanical engineering

Optics, Electricity and Electronics

Structural Metallurgy

Geology (mineralogy, petrography, mineral resources...)

Management

Mining Legislation and worker's law

Communicating technics : French and English

Management and Protection of the environment

Professionnal training in Industry (4 weeks).

DEUST in Metallurgy

2nd academic year : around 600 h

Data processing (ACCESS, SQL, SQL, CAO/DAO..)

Extractive Metallurgy and purification processes

Corrosion and anti-corrosion systems

Crystallography and Mineral Chemistry

Organic Chemistry

Control of processes

Sampling methods

Methods for Chemical engineering

Chemical and engineering systems

Fluids systems : Transport and treatments

Industrial drawing

People and environmental protection in industrial zones

Quality assurance

+ Professional training in industry (6 weeks).