

Master of Forestry at the University of Tasmania

The new Master of Forestry at the University of Tasmania is part of the National Forestry Masters (NFM) program offered by a consortium of universities (UTas, ANU, UMelb, SCU and UQ). The NFM program is unique because it gives students enrolled at any of the above universities exposure to national leaders in forest management and research across Australia as well as an introduction to most of the major Australian forest systems in one collaborative course. Students are supported to travel nationally and internationally to complete off-campus components of their course. You will complete with an Institute of Foresters of Australia (IFA) accredited Masters degree, ready for employment in an industry suffering from a shortage of qualified professionals. The University of Tasmania course is 2 years full time or 4 years part time and is comprised of 16 unit equivalents (all units below are 1 unit equivalent unless indicated otherwise).

Each student enrolled at the University of Tasmania has to complete:

- 2 joint national units (Australian forestry, Asia-Pacific forestry);
- 2 to 4 forestry units (partnership units) offered by university consortium partners ANU, UMelb and SCU;
- 2 University of Tasmania forestry units (Plantations and the environment, Tree breeding);
- Industry placement/Research project (equivalent to 4 units);
- 2 business units (Organisational behaviour, Financial reporting and analysis); and,
- 2 to 4 ecology and GIS units offered at the University of Tasmania (Plant ecology, Field botany, Australian landscape change, Molecular ecology and evolution, GIS: introduction)

Unit descriptions for each requirement can be found below.

Contact: course co-ordinator Dr Neil Davidson (ph 03 6226 7606, mob 0427 308 507, email Neil.Davidson@utas.edu.au)

Unit descriptions

Joint national units

Australian Forestry joint course (offered in summer, February 11-22)

The 2008 Australian joint course provides an introduction to Australia's forests and forestry. It comprises 5 days at the University of Melbourne's Creswick campus (11–15 February), followed by a 6-day field course (17–22 February) in Tasmania. The Tasmanian field course includes participation in the "Old Forests, New Management" conference. Students will travel to Tasmania on 16 February and return to Melbourne on 23 February. The course is co-convened by Professor Peter Kanowski (ANU) and Dr Chris Weston (Melbourne). For more information, contact [Chris Weston](#).

Asia-Pacific forestry joint course (offered in summer, February 11-22)

The 2008 Asia-Pacific joint course will be conducted with regional partners between 1–13 December. Details are still being finalised, but they are likely to include the UN Food and Agriculture Organization's (FAO) Regional Office for Asia and the Pacific and the Regional Community Forestry Training Centre for Asia and the Pacific (RECOFTC), and will include field visits in Thailand and neighbouring countries. The

course is co-convened by Professors Rod Keenan (Melbourne) and Jerry Vanclay (SCU). For more information, contact Rod Keenan

Forestry units (partnership units) offered by university consortium partners ANU, UMelb and SCU

These units are intensive units taught in blocks during second semester.

Sustainable Forest Management (June 2-13)

This subject presents the basis for sustainable forest management, the policy framework governing forest management, the scientific basis of landscape ecology and tools and techniques for analysis, design of management practices in forest landscapes and processes for successful development and implementation of forest management plans. The coordinator of this subject is Professor Rod Keenan. For further information, contact <<mailto:rkeenan@unimelb.edu.au>>Rod Keenan

Forest operations (June 23 – July 4)

This subject provides an overview of forest & plantation harvesting operations including mechanized harvesting methods, cable yarding, transportation systems, forest road management, and harvest planning. It involves application of harvesting and operations cost assessment techniques and planning software to help frame problems and provide information for contemporary forest & plantation management. Students will apply the information learned in the course to develop a harvesting plan and present the plan. At the end of the subject students should be able to:

- describe the capabilities and limitations of harvesting, transportation & operations equipment and systems that are used in different native forest and plantation applications;
- identify the appropriate variables that affect harvesting productivity, cost, and safe working conditions;
- obtain operations productivity rates, calculate machine rates, and harvesting cost;
- use current harvesting software to aid decision making, and forest or plantation planning;
- complete a forest/plantation harvesting plan that includes all aspects of roads and transportation planning, tree harvesting, and meeting environmental, regulatory, and social management objectives.

The coordinator of this subject is Prof Loren Kellogg. For further information, contact Loren Kellogg or see www.forests.unimelb.edu.au

Participatory Resource Management: Addressing Environmental Conflict (July 14-18)

There is increasing recognition of the need to actively involve different stakeholders and communities in the process of making decisions about natural resource management (NRM). This course provides a critical review of participatory resource management (PRM) approaches, exploring when and why different PRM processes succeed or fail to resolve conflicts between stakeholders. Students learn the theories underpinning different PRM approaches, and practical skills such as group facilitation, stakeholder analysis and how to design and manage participatory processes. A series of guest speakers discuss recently implemented Australian and international participatory processes, and the class evaluates the factors that affected the success or otherwise of these processes. Recent research is reviewed to identify how theory

and practice is shifting in the rapidly evolving field of PRM. The course assessment is designed to ensure students apply the facilitation skills being taught, and that students can explore topics of particular interest to them in the field of PRM. For more information, contact <<mailto:jacki.schirmer@anu.edu.au>>Jacki Schirmer

Catchments and Water: Issues around the World (July 28 – August 8)

Water is the resource that most limits national development in many areas of the world. Droughts and floods are still major causes of human misery. Humans compete with vegetation for water, and the “balanced use of water resources” is a continuing debate. This subject takes the view that all water resource issues involve technical, social, political and economic aspects and attempts to untangle the issues and define “solutions.” The subject involves considerable introductory hydrology including the hydrologic cycle, principles of stream flow, groundwater movement, and water quality. The subject will involve a mixture of lectures, “doing it” tasks including graphical and statistical analysis, excursions, and discussions. Particular stress will be placed on the problems of international rivers and a hydrologic system that does not recognise private property boundaries. Grading of the subject will be based on completion of a workbook of set tasks plus two major assignments, one of which will be an analysis of a long-term sequence of data and one will be an examination of a complex hydrologic issue. The subject will involve an overnight excursion to the River Murray examining issues associated with management of the river for diverse human and ecological needs. The coordinator of this subject is Associate Professor Leon Bren. For further information, contact <<mailto:l.bren@unimelb.edu.au>>

Silviculture and Forest Dynamics (August 8-29)

This subject presents the science used in the management of native forest and plantations, covering forest establishment, composition, growth and quality to achieve specified objectives. It explores the silvics of tree species and their influence on growth and management for the production of forest goods and environmental services. It covers the silvicultural principles and practices important to achieving the range of objectives for forested land such as water, wildlife habitat, ortimber production. On completion of this subject, students should have an advanced understanding of: the dynamics and growth of forests and different stages of stand development, the effects of site climatic and edaphic factors and interactions among species on forest stand development and productivity and the design of silvicultural management practices for specific situations and products using modern modeling tools. The co-convenors of this subject are Mr Mark Stewart and Mr Simon Murphy. For further information, contact <<mailto:marks@unimelb.edu.au>>

Modern techniques of forest inventory (October 6-10)

This course promotes student understanding of the art and science of forest resource management by focusing on the issues involved in quantitative assessment of trees and forests. Specifically, the aim is to:

- Present the state of the art and methodologies applicable for modern forest inventory
- Present methods for formulation and planning an effective and efficient inventory
- Enable participants to implement a modern inventory system and determine the advantages and disadvantages of available systems
- Enable participants to process inventory data to determine reliable estimates and confidence limits of product volumes

Topics include: introduction to sampling theory; issues involved in effective inventory design; equal and unequal probability sampling techniques; modern mensuration

tools and techniques; designing and implementing an unequal probability-based inventory; and, dealing with problem data. For more information, contact <<mailto:cris.brack@anu.edu.au>>Cris Brack

Forestry units (partnership units) offered by University of Tasmania

These are intensive 2-week units taught during second semester

Plantations and the environment KPAXXX (September 8-19)

Explores the use of plantations in several different contexts; industrial plantations, farm forestry and restoration ecology. Lectures and field activities will focus on silvicultural inputs to improve plantation productivity in a sustainable manner (e.g. site preparation, weed control, fertilisation, inter-rotational management, pruning, thinning, harvesting) and the impact that plantations have on the environment (e.g. carbon sequestration, water use and water yield, nutrient cycles, biodiversity).

Tree breeding KPAXXX (October 20-31)

Genetic improvement programs play an important role in improving the profitability of Australia's softwood and hardwood plantations. This unit introduces the application of genetic, economic and biological principles to tree breeding and deployment programs. Specific topics addressed in the unit include Mendelian and quantitative genetics, forest tree breeding strategies and the breeding cycle, bio-economic modelling, breeding objectives, selection criteria and their assessment, experimental design, progeny testing, genetic evaluation and the estimation of genetic worth, reproductive biology, deployment strategies, seed orchard management, clonal production systems and the application of biotechnology.

Core industry or research experience

Industry placement/Research project KPAXXX (flexible)

Industry placement

Students have an opportunity to gain experience working in a forestry company or with a state forestry or resource management agency. During placement, students will submit a monthly professional experience diary that shows satisfactory performance in the workplace. Students complete the diary, one-line for each day worked. This indicates what type of work they were undertaking, whether it was office or field based, and what level of responsibility they had. At the end of each month, their supervisor completes an assessment of their ability (standard gradings against a set of criteria) and adds any comments. The student may also add comments. Provided all diaries and grades are satisfactory, the student will be awarded an ungraded pass in the unit.

Research project

Students will choose to conduct their research on-site with company staff or based at the University of Tasmania. Logistical support and supervision will be offered for projects across a range of disciplines in forestry. The aim of the unit is to give students some experience in individual research in an area of their own choosing. Students can expect that forestry company research staff and university supervisors will have some suggestions for projects (a list will be posted shortly), but these will need to be developed before the project starts. Assessment will be by report.

Core business units offered by University of Tasmania

Organisational behaviour BMA581 (semester 2, July 14 – October 17)

Management is ultimately about influencing the behaviour of others within an organisational context and in many ways the study of Organisational Behaviour is the reference point for all other areas of management education. The unit is structured around four key areas: the individual, the group, the organisation, contemporary issues in organisational behaviour. The unit seeks to establish a conceptual understanding of the dynamics of individual and group behaviour within organisations, and the ability of an organisation to change in response to external events and to create its own dynamics of change

Financial reporting and analysis BFA582 (semester 2, July 14 – October 17)

The Financial Reporting and Analysis unit aims to develop your ability to understand, analyse and interpret corporate financial statements and financial information. Consideration will be given to the underlying concepts and regulatory requirements that underlie the preparation of financial reports. Limitations of conventional reporting practices and analysis are noted. The relevance of non financial information is also considered. Areas of management accounting relevant to decision making and possible future directions of accounting are discussed

Ecology and GIS options offered by University of Tasmania

Plant Ecology KPA379 (semester 1, February 25 –May 30)

This unit provides a comprehensive overview of the processes shaping terrestrial plant populations, communities and ecosystems with special attention paid to plant-animal interactions and global change biology. Students develop practical skills in the analysis of vegetation, the analysis and projection of population size and dynamics and the investigation of plant-animal interactions. The lecture course covers modern thinking in plant ecology, plant-animal interactions and the responses of species, communities and ecosystems to global climate change. The practicals, half of which are based in the field, provide skills in the collection, analysis and interpretation of ecological data

Field Botany KPA375 (summer, February 11-20)

Students are exposed to the diversity of plants found in environments that range from near sea level to alpine, from rich basalt soils to ancient weathered quartzite, and from sites ravaged by clearfelling and burning to 4,000-year-old cool, temperate rainforest, all in close proximity to the Mt Field National Park and Southwest World Heritage Area.

The first part of the course is field-based, with informal lectures and practical exercises conducted in the Mt Field National Park and SW Tasmania over 5 days, with some plant identification work at night. There is a quite strenuous walk along the Tarn Shelf, over Newdegate Pass and back along the Rodway Range. Students that are not physically fit must seek the advice of the course coordinator. This part of the course is based at the Tyenna Lodge, Maydena.

The second part of the course introduces demographic techniques, conservation strategies and practice, and examines applied ecological practice in forestry harvesting methods in wet sclerophyll forest in the long-term monitoring site at

Warra in two day excursions from the Sandy Bay campus. Assessment is by: a field test (40%) on the last day of the course, assessing plant identification ability and an understanding of the ecological processes shaping the vegetation; two reports based on data collected in the field (50%); and a group plant collection (10%).

Australian landscape change KPAXXX (semester 2, July 14 –October 17)

This unit explores the factors that control the distribution of Australian vegetation. It describes the major physiological factors that constrain plant growth and how these factors have moulded our biota. It will focus on the past and present effects of plant water use, fire and nutrients. It will also consider the possible long-term impacts of human land use and current environmental change

Molecular ecology and evolution KPA377 (semester 2, July 14 – October 17)

Provides theoretical and practical experience on the use of genetic and molecular tools to study ecology, evolution and natural history. The first part of the lecture series will introduce modern laboratory techniques and describe the nature of the genetic data provided by each method. The second part and largest lecture series will cover specific examples and topics where molecular markers and ecological genetic tools have been used, such as: spatial distribution of clones; paternity and maternity analysis (fingerprinting); gene flow; speciation and hybridisation; phylogeography, phylogeny and conservation genetics. The practicals will provide training for students interested in research and the application of molecular methods.

GIS: Introduction KGG 240 (semester 1, February 25 – May 30)

This unit introduces the basic concepts and applications of Geographic Information Systems (GIS). Definitions, components and functions of GIS are examined. The theory behind spatial data representation, data structures, vector and raster data models, analysis, and map algebra is addressed. A significant component of the unit consists of practical sessions using PC based GIS packages designed to apply concepts presented in lectures. Techniques for data collection, data integration, data manipulation, spatial analysis and modelling are introduced. Emphasis is placed on GIS as an integrating technology incorporating a range of applications and the increasing interaction between GIS, Global Positioning System (GPS), Photogrammetry, and Remote Sensing. Students examine the decision support role of GIS through the development and implementation of solutions to spatial problems including multi-criteria decision making and other means of spatial data analysis

NFM research topics and supervisors at UTas

Tasmania is an excellent place to conduct forestry research, as there are a wide variety of intact native forest systems, both reserves and commercial forests and plantations within a days' drive from the university. The university also offers excellent glasshouse facilities, equipment, technical support and research teams associated with the CRC for Forestry (on campus at the University of Tasmania) and close interaction with the forest industry. For more information on supervisors see: <http://fcms.its.utas.edu.au/scieng/plantsci/people.asp>

The "Research project" is equivalent to 4 units i.e. a 50% load for the year. You will spend half a year studying a research topic of your choice. Assessment will be based on a final report and an oral presentation of results.

Topics and supervisors

Climate change – the effect on forest systems of rising temperatures and concentrations of greenhouse gases (supervisor Mark Hovenden)

Landscape ecology and fire – the distribution of forest systems in response to altered fire regimes associated with climate change (supervisor David Bowman)

Restoration ecology – reversing tree decline in native forest remnants and establishing environmental plantings in the agricultural landscape (supervisors Neil Davidson and Dugald Close)

Eucalypt ecology – ecological factors (drought, frost, waterlogging, nutrition, fire) affecting health and dominance of native eucalypt species in response to a changing climate (supervisors Neil Davidson and Dugald Close)

Plantation physiology – water use, root development, water relations, photosynthesis, photoinhibition, etc of plantation trees in response to silvicultural practice (e.g. pruning thinning) or pests and disease (supervisor Tony O'Grady, CSIRO supervisors Chris Beadle and Caroline Mohammed).

Soils and nutrition – soil properties, nutrient deficiencies and fertiliser management; riparian forestry (CSIRO supervisor Philip Smethurst)

Wood quality – the effects of genetics and environment on the expression of wood quality characteristics and wood development (CSIRO supervisors Chris Harwood and Geoff Downes)

Yield modelling – process-based models for predicting tree growth and forest production, the effects of silvicultural interventions and sustainability of yield (CSIRO supervisors Michael Battaglia and Auro Almeida)

Eucalypt breeding - quantitative genetic control of traits of economic and ecological significance in eucalypts (supervisors Brad Potts and Greg Dutkowski)

Environmental genetics – eucalypt gene resource management and genetic pollution (pollen flow from exotic plantation species into native eucalypt populations) (supervisors Brad Potts and Rene Vaillancourt)

Molecular genetics – using molecular techniques to study genetic diversity in eucalypts and molecular breeding (supervisor Rene Vaillancourt).

Browsing management – factors affecting susceptibility of eucalypts to mammalian and insect browsers (supervisors Julianne O'Reilly-Wapstra and Brad Potts)

Reproductive Biology – eucalypt reproductive biology and hybridisation (supervisor Brad Potts)