

University of Canterbury

**New Zealand School of Forestry**

**Student Handbook**

**2008**

*The course outlines should be read in conjunction with the Prospectus of the School of Forestry, the University of Canterbury Calendar and the Enrolment Handbook of the University of Canterbury. Outlines are given for those subjects offered by the School. Students should consult other departments/College Offices for outlines to subjects they offer.*

Cover image: *Stilbocarpa polaris* growing under Southern rata on Enderby Island, Auckland Island (D.A. Norton)

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# The School of Forestry in 2008

The School of Forestry has weathered some changes in recent times and has emerged the stronger and better for it. In much of the western world, the number of students undertaking forestry courses has diminished. This impacts on the financial viability of forestry schools and some have gone under while others have entered into collaborative liaisons that have diluted forestry content and weakened their relevance to potential employers. Our School has gone in the opposite direction. We have consolidated and focused forestry content and consequently we retain a programme that is relevant to employers. We know this because the employers tell us so and also we are heartened by the increasing acceptance of our graduates in some other countries in preference to their own.

We're delighted to be welcoming Assoc Prof Rien Visser to the School from June 2008. Rien is an engineering graduate of the University of Canterbury and has a solid background working (and networking) in the forest industry and in academic circles, most recently from Virginia Tech. He will assume the role of Director for the Forest Engineering Programme. We also expect to have two new appointments in place – one to complement Rien Visser's forest engineering role and the second a new forest economist.

We are seeing an increasing awareness in New Zealand and elsewhere of the diverse roles that forests play. Forests have long been seen as important for the New Zealand economy – forest products make up 10% of total exports. However forests are now being seen as important because of their environmental and social benefits. Carbon sequestration, erosion reduction, water quality improvement and better biodiversity outcomes are some of the environmental benefits from forests. For example, the Emission Trading Scheme recently announced by the Government has carbon sequestration by plantations as its centrepiece.

These developments create additional research opportunities for undergraduate and postgraduate students as well as employment prospects for our graduates. It is an exciting time to be doing a degree at the New Zealand School of Forestry.

And of course, one of the great things about doing a forestry degree is the small class size – you soon get away from courses with hundreds of students and become part of a tight-knit group. The friendships that you form (from being at Forestry School and going on field trips together) will last for life. The personal approach to teaching and research will continue to be a feature of the School.

Bruce Manley

## **Staff**

### **Professor**

J.C.F. Walker, M.A. (Oxf), Ph.D. (Camb)

Wood processing; Mechanical properties of wood; Drying and preservation;  
Properties of juvenile wood

### **Associate Professor and Head of School**

B.R. Manley, B.For.Sc.(Hons), BBS(Accountancy), Ph.D. (Wash.), F.N.Z.I.F.

Forest management planning; Forest estate modelling; Forest valuation

### **Associate Professors**

E.G. Mason, B.Sc.(For), Ph.D. (Cant)

Silviculture; Modelling of forest growth and yield; Artificial intelligence applications

D.A. Norton, B.Sc. (Hons), Ph.D. (Cant)

Restoration ecology; Ecosystem conservation; Forest pattern and process;  
Forest microclimates; Threatened species conservation

J.M. (Rien) Visser, B.E.(Hons), M.E., Dr. nat. techn. (Bodenkultur)

Harvest systems; Biomass harvesting and transport logistics; Value recovery and  
marketing; Environmental impacts; Forest engineering

### **Senior Lecturer & Chair, Forestry Board of Studies**

C.H. Cochrane, B.Sc., M.Sc.(Hons), Dip. Tchg., Ph.D.

Vertebrate pest impacts

### **Senior Lecturers**

L.A. Apiolaza, B.For.Sc.(Hons), For.Eng., PhD (Massey)

Tree breeding; Quantitative genetics

R.N. O'Reilly, B.Sc.F. (Tor), M.For.Sc. (Cant), M.N.Z.I.F.,

Forest engineering; Forest harvest planning; Work science and ergonomics;  
Production planning and control

### **Industry Appointments**

R.H. Donnelly, B.Sc. (Wash), M.F., Ph.D. (Yale)

Marketing; International trade

### **Adjunct Associate Professor**

R.C. Woollons, B.Sc., Ph.D. (Cant), M.N.Z.I.F.

Forest growth modelling; Forest experimental design and analysis;  
Statistical methods in forestry; Forest mensuration; Time series

## **Senior Fellow**

J.A. Adams, B.Sc.(Hons), Ph.D. (Cant), MNZIC

Forest soil processes; Tree nutrition; Nitrification in forest soils;  
Soil-vegetation relationships in forests

K. Chapman, B.E.(Hons), Ph.D. (Cant)

Engineered Wood Products

P. Clinton, B.Sc., M.Sc., Ph.D. (Cant)

Soils and tree nutrition

N. Ledgard, B.Sc. (Auckland), M.Sc. (Bangor)

Trees for cold climates; Specialist timber species; Wilding tree spread; Farm forestry

## **Adjunct Teaching Staff**

R. Sands, B.Sc.For.(Hons), Ph.D. (ANU) – Emeritus Professor

Tree physiology; Soil science; Silviculture

B. Fahey, B.A., M.A. (Otago) Ph.D. (Colorado)

Forest Hydrology

A. Griffiths, B.For.Sc.

Management of indigenous forests

## **Technical Staff**

D.K. Clark, N.Z.C.S. (Stats)

N. Pink, B.For.Sc.

V. Wilton, B.Sc., Dip.Sc.

L. Kirk, NZCS

## **School Administrator**

J.C. Allen

# Degree Schedules

## Bachelor of Forestry Science

### 1ST YEAR (Canterbury)

BIOL 112	Ecology, Evolution & Conservation
BIOL 113	Diversity of Life
Chemistry	18 Points at the 100 level (CHEM112 recommended for 2007)
FORE 111	Trees, Forests and Environment
FORE 121	Forests and People
FORE 131	Trees in the Landscape
FORE 141	Forest Growth and Measurement
FORE 151	Commercial Aspects of Forestry
STAT 111	Statistics I <b>or</b>
STAT 131	Statistics IA

### 2ND YEAR

FORE 202	Plant Ecology
FORE 215	Introduction to Forest Economics
FORE 216	Surveying & IT in Forestry
FORE 218	Forest Ecosystem Health
FORE 219	Introduction to Silviculture
FORE 222	Biometry IA
FORE 224	Biometry IB
SOIL 203	Soil Fertility

### 3RD YEAR

FORE 305	Forest Engineering
FORE 307	Silviculture
FORE 316	Forest Management
FORE 327	Wood Science

and two further subjects from the Option Schedule

### 4TH YEAR

FORE 419	Management Case Study
FORE 444	Sustaining Biodiversity on Private Land
FORE 445	Environmental Health

and three further subjects from the Option Schedule

### OPTION SCHEDULE

FORE 410	Biometry 2 ( <i>May not be offered – subject to minimum enrolments</i> )
FORE 414	Dissertation ( <i>Only available in Year 4 to Honours students</i> )
FORE 422	Forest Harvest Planning
FORE 423	Forest Transportation Planning
FORE 426	Forest Products Marketing and International Trade
FORE 435	Forest Economics 2 ( <i>Unlikely to be offered in 2008</i> )
FORE 436	Forest Tree Breeding
FORE 441	Engineered Wood Products ( <i>Not offered in 2008</i> )
FORE 442	Application of Information Technology in Forestry
FORE 443	Biosecurity Risk Management
FORE 475	Independent Course of Study (Community Forestry – <u>2008 only</u> in 2 <sup>nd</sup> Semester)

22 or 28 points from another Faculty (one available across Years 3 and 4)

Assessment details will be handed out in class on the first day of each course. Lecture hours are included in course descriptions for undergraduate papers, but are subject to change at the time of writing. Final timetables will be available from the School Administrator from Enrolment Week. Lecture venues can be found at <http://www.canterbury.ac.nz/courses>.

## **Graduate Diploma in Forestry**

The Graduate Diploma is suitable for providing exposure to forestry for graduates with degrees other than forestry. Applicants with a degree from any university will be considered.

The Graduate Diploma requires six subjects, selected from the Bachelor of Forestry Science schedule. Normally, at least four of these courses shall be from the 300 and 400 level. Time required for the Diploma is one year. One subject may be taken from other departments of the university providing they can be timetabled and they are relevant to and of sufficient size and standard to be part of the Graduate Diploma programme.

## **Postgraduate Diploma in Forestry**

The Postgraduate Diploma is suitable (1) for retraining those who already have a forestry degree or associated qualification from the past; (2) for providing some exposure to forestry for graduates with degrees other than forestry; and (3) as a qualification for entry to the Master of Forestry Science for those who are otherwise ineligible. Applicants with a degree from any university will be considered. (Students with degrees other than forestry may have sufficient forestry-approved courses to be eligible to enter the Bachelor of Forestry Science degree in second or third year.)

The Postgraduate Diploma requires four subjects taken at 600 level (equivalent to the first year of a Master of Forestry Science). The time required is one year. One subject may be taken from other departments of the university providing they can be timetabled and they are relevant to and of sufficient size and standard to be part of the Postgraduate Diploma programme.

Any student who satisfactorily completes the Postgraduate Diploma in Forestry is eligible for enrolment in the second year of a two year Master of Forestry Science degree.

## **Master of Forestry Science**

There are three ways of obtaining the Master of Forestry Science degree:

- a) by examination and report (six subjects plus a report, minimum time 2 years);
- b) by examination and thesis (four subjects plus a thesis, minimum time 2 years);
- c) by thesis (minimum time 1 year).

*Candidates with a Bachelor of Forestry Science with Honours are entitled to choose from all categories. Candidates with any four-year degree in appropriate subjects at an acceptable grade, or with a Postgraduate Diploma in Forestry may also be considered for all categories depending on their background and the nature of the research topic. Otherwise they will be eligible for categories A and B. Candidates who have met all the requirements for a Postgraduate Diploma in Forestry may transfer to Masters A or C without taking up the Postgraduate Diploma.*

Usually candidates with a three year degree will be required to undertake the Postgraduate Diploma before being enrolled in Masters A, B or C, although some candidates with a good three year degree who wish to pursue research in a specific area will be considered for Masters B. Those candidates who do not have the qualifications listed above but consider that they can provide a case to support admission to candidature can apply to the university for *ad eundem* admission.

The Masters A report is a scholarly document, usually of research, of less than 20 000 words. The thesis in Masters B and C is an original piece of research which may be up to 50 000 words.

## Doctor of Philosophy

The Doctor of Philosophy is a research degree of at least three years duration. Candidates need a good Honours degree or a Masters degree to enrol. Research undertaken towards a Doctor of Philosophy, and the reporting of it, are required at the highest international standard. The research must be original and make a significant contribution to knowledge. Under some circumstances, candidates enrolled in a Masters degree may transfer to a Doctor of Philosophy degree if progress has been very good and the nature of the research is suitable.

## Papers for Masters Students in 2008

### 1st Semester

FORE 604	Advanced Forest Tree Breeding & Genetics
FORE 607	Forest Harvesting
FORE 610	Research Methods
FORE 613	Strategic Marketing in Forest Products
FORE 624	Plantation Silviculture
FORE 643	Modelling for Management (web-based course)

### 2nd Semester

FORE 606	Forest Transport
FORE 614	Processing
FORE 616	Restoration Ecology
FORE 641	Plantation Forest Management
FORE 642	Advanced IT Applications in Forestry
FORE 650	Special Topic in Forestry Science: Community Forestry ( <u>2008 only</u> )
FORE 665	Pest Management & Biological Security
FORE 609	Advanced Wood-Based Composites ( <i>Not offered in 2008</i> )
FORE 612	Advanced Forest Economics ( <i>Unlikely to be offered in 2008</i> )

### Thesis/Report Numbers (anytime or S1 or S2 enrolment):

FORE 679	MForSc Report
FORE 690	MForSc Thesis
FORE 790	PhD Thesis

The School reserves the right not to offer a course if the number of student enrolments falls below a minimum level.

Please check with the School Administrator for information on planned Special Topic courses.

## Special Topics/Independent Course of Study

The special topic/independent course of study allows a student to undertake some directed study in an area of interest, or the School to offer a one-off course. For example, a student may wish to study 'harvesting effects on soil properties and consequences for future production' or perhaps 'forest certification in New Zealand and its impact on environmental management and on marketing of forest products'. If the student can come to an agreement with a staff member who is prepared to supervise, then a special topic can be authorised. Usually the assessment will be directed reading and assignments. Also a special topic can be used to undertake the literature review and preparatory planning for a subsequent Masters report or thesis. The one-off course offering can be brought about where the School

has an Erskine Fellow teaching for a defined period (typically one term) and we are able to offer a special paper (such as Community Forestry) to all students during the period of the Fellow's visit.

Unfortunately there is no guarantee that a Special Topic can be offered to students on request. It depends on finding satisfactory supervision.

Please see the School Administrator for Special Topic numbers and semesters.

In addition, we have two targeted Special Topics – Research Project (FORE 670 and 672) which have been set up for international students wishing to do a research project under the Certificate of Proficiency system for credit towards a degree at their home university in France or Germany. There is one Special Topic with a maximum three-month time frame and one with a maximum six-month time frame.

Assessment details for all courses will be advised at the commencement of lectures.

# Assessment

## Grades

The mark/grade/point equivalents used in the School of Forestry are given below. Note that there is no C- grade in the School of Forestry.

Percentage	Grade	Grade Point	Percentage	Grade	Grade Point
≥ 85%	A+	9	60-64%	B-	4
80-84%	A	8	55-59%	C+	3
75-79%	A-	7	59-54%	C	2
70-74%	B+	6	40-49%	D	0
65-69%	B	5	<40B	E	-1

## Honours

### Bachelor of Forestry Science

All Faculties in the University of Canterbury give recognition to their top academic students by awarding their degree with Honours. Many Faculties identify prospective Honours students on the basis of grades achieved in the first years of their study and invite them to enrol in the Honours programme.

In Forestry, we use the grades students obtain in Years 2 and 3 as a basis for inviting academically able students to enrol in FORE 414 Dissertation, a research course taken in addition to the regular Year 4 courses. The Dissertation is an opportunity for students to gain experience in research methods and analysis, providing a basis for employment in forestry research or postgraduate study. Students who perform consistently well in all their courses in Years 3 and 4, plus Dissertation, may graduate with Honours (First Class, Second Class Division I or Second Class Division II).

There will be students who are close to, but do not meet, the grade point average set for automatic invitation to do Honours. These students may apply to the Head of Department to enter the Honours stream if they wish to.

The grade point average required for invitation to Honours is B. In the calculation of Honours, grade points will be taken at face value, except for the Dissertation, which is weighted at 3, and Case Study at 1.5.

<b>HONOURS</b>	<b>GRADE POINT TOTAL</b>	<b>GRADE AVERAGE</b>
1st Class	101.5 or higher	A- or better
2nd Class		
Division 1	87-101.4	B+
Division 2	79.75 - 86	Midpoint between B and B+

## **Graduate Diploma in Forestry**

The Graduate Diploma is offered by pass and distinction. Distinction is equivalent to a GPA > 8.

## **Postgraduate Diploma in Forestry**

Postgraduate Diploma is offered by pass and distinction. Distinction is equivalent to a GPA > 8. Where a candidate has qualified for the award of the Postgraduate Diploma and has demonstrated research potential and has the support of the Head of Department, he or she may abandon the Postgraduate Diploma and transfer to the Master of Forestry Science degree, with such crediting of courses passed as may be approved by the Head of School. A candidate who has transferred from the Diploma may not enrol in a course at 600 level which has been previously credited at 500 level.

## **Master of Forestry Science**

Masters degrees may be passed with first class honours if the GPA is  $\geq 7$ , with second class honours Division I if the GPA is 6-7 and Division II if the GPA is 5.5-6. The weighting for Masters reports and Masters theses are 2 and 4 times that of subject examinations respectively.

Thesis students should ensure they are fully conversant with Degree Regulations and Guidelines, particularly in relation to maximum time limits for completion of the thesis. Copies of these can be obtained from the School Administrator or found on-line at:

<http://www.canterbury.ac.nz/acad/phd>

## **Scholarships and Prizes**

There are added incentives to excel. Scholarships and Prizes are awarded to the top students both within the School (the NZ School of Forestry Schlich Memorial Prize at undergraduate level) and throughout the University (the University Prize and the Senior Prize); there is a Dissertation Prize of \$300 awarded to the "best and most innovative Dissertation"; and the M.R. Jacobs Prize for the top student in Silviculture.

At postgraduate level there are a number of scholarships available from the University (including the TW Adams and Owen Browning Scholarships which are specifically for Forestry students) and the School awards the Graham Whyte Prize for the top postgraduate each year. The School also offers an award each year to assist postgraduates with expenses related to attending conferences (the McKelvey Prize).

A complete list of scholarships and prizes is available from the School of Forestry office.

# School of Forestry Policy, Guidelines and Regulations

## Handing in assignments

### Late Assignments

Late assignments will be accepted at or before 5 pm for up to three days after the due date in which case there will be a drop of three grades (e.g. B+ to C+). Assignments will not be accepted more than three days after the due date. The only exception to this is where late submission is accompanied by an appropriate medical certificate, or when prior permission has been given by the Head of Department. The reason for these rules is to protect the majority of the class. If there were no penalty for late submission, the late presenter would be at an advantage over other students.

### Assessment Declaration

When you hand in assessment material, you are required to complete and attach the Essay/Report Cover Sheet. This is available from the reception counter.

## Reconsideration of grades

Any student may apply in writing to the Registrar within four weeks of the date of publication of final results for reconsideration of a final grade. The application must be accompanied by the prescribed fee which will be refunded if the application results in a change of grade. The reconsideration will normally consist of a re-marking and re-counting of the final examination script (if any) together with a recount of the marks awarded for any other items of work. (Most often the result of such a re-consideration is no change in grade).

A student may, within 7 days after the result of a major test or other major work is made known, apply to the Head of Department to have it reconsidered. The reconsideration will normally consist of a remarking and re-counting of the work submitted. A major work or test is one which is worth no less than 10% of the final assessment.

Further details on assessment can be found in university Regulations contained in the University Calendar.

## Aegrotat consideration

Aegrotat consideration is given for **impaired performance** (i.e. in the demonstration of what has been learnt) but not where it is the **ability to learn** that has been impaired.

An aegrotat application must be submitted to the Registrar on or within 7 days of the due date for assessment – together with satisfactory supporting evidence from an appropriate source.

The School may offer an extension without penalty for work (other than tests or examinations) where a student is unable to complete work by the due date for reasons acceptable under the aegrotat regulations.

Further information on aegrotat considerations can be found in the University of Canterbury Calendar. Copies will also be available on noticeboards throughout the School.

## Appeals

Any student aggrieved by a decision of the Head of Department or the Dean of the Faculty may appeal to the Academic Board. Procedures are given in the University Calendar.

## Disabilities

Special provisions are available to students with disabilities. If you have a disability that you consider could impair your performance, please register this with the Chair, Forestry Board of Studies at the beginning of your studies. You should also contact Gill Fowler, Students with Disabilities Coordinator, Maths & Computer Science Building (Level 4).

## Dishonest practice

This is mainly concerned with cheating. Sometimes students are surprised and dismayed when they find out that what they are doing in their assessment is considered by the university to be cheating. The following describes what is considered to be cheating by the School of Forestry. It is obviously very important that you understand what we mean by cheating because it is taken very seriously and penalties range from being marked to zero for that component of the paper, through being failed in the whole paper, to being excluded from the university. The following should be considered in conjunction with the section on 'dishonest practice and breach of instructions' given in the University of Canterbury Calendar.

(1) copying

Copying of another person's work, with or without his or her consent is cheating.

(2) collusion

Students must not present common material in assignments and practicals unless expressly asked to do so. Even when data are collected and discussed in groups, the submission for assessment must be a totally individual effort.

(3) ghost writing

Students must not allow others to write their assignments and then present them as though they were their own work.

(4) offering substantially the same work for more than one item of assessment in the same or different subjects. (If you are in doubt about this, please consult the relevant lecturer.)

(5) plagiarism

This is probably the most misunderstood form of cheating and is the one that causes students the most problems. It is very important that you understand exactly what constitutes plagiarism. Details are provided below.

## Plagiarism

(The School of Forestry would like to thank the Political Science Department for permission to reproduce its handout *Conventions of Scholarly Style and the Need for Academic Honesty*).

Plagiarism is the use without proper acknowledgement of someone else's material. It is considered dishonest and carries the highest penalties in the university. However, while some of the most obvious forms of plagiarism are easily recognised, there are more subtle forms which one can fall into often without even realising it.

It is important to recognise that all scholarship involves using other people's material in a whole variety of ways. Since normal essays, articles and books all rely heavily on previous scholarship, it is important for a writer to distinguish between the contributions of this scholarship and his or her own contribution. In

most cases a writer's original contribution to scholarship consists mainly of selecting, ordering, summarising and interpreting what other scholars have said. It is therefore important to learn how to reference properly, that is, how to specify clearly what your debts are and how to acknowledge them. Then your own contribution can be more clearly identified and appreciated.

#### Common forms of Plagiarism: From the Obvious to the More Subtle

- (a) Copying an essay from another student and submitting it as your own.
- (b) Copying a journal article or a section of a book and submitting it as your own.
- (c) Lifting sentences or paragraphs from someone else (essay, article, book, web page, etc.), that is, quoting from them verbatim, without using quotation marks and without proper acknowledgement.
- (d) Lifting sentences or paragraphs from someone else, without using quotation marks, but with proper acknowledgement. Here the impression is that the idea or information comes from the source cited, but that the phrasing, the choice of words to express it, is your own contribution.
- (e) Using significant ideas from someone else, but putting them into your own words and not acknowledging the source of the ideas. Here the impression is that both the ideas, as well as the form of expressing them, belong to you.
- (f) Heavy reliance on phrases and sentences from someone else without proper acknowledgement, thus giving the impression that these phrases as well as the idea they express are your own.

At this point plagiarism begins to give way to practices which, while not dishonest in themselves, are nonetheless indicative of weak scholarship.

- (g) Excessive reliance on other people's material, that is, direct quotations (with quotation marks and with proper acknowledgement), so that your sources speak for you and your own contribution is minimal. While this is not dishonest, your own contribution would be greater if you used your own words more and relied less on quotations. Try not to rely excessively on quotations.

Among the most common legitimate uses of quotations are:

- (i) When you want to comment on (for example, to criticise it) what someone else has said, and it is important not to distort it by putting it into your own words;
- (ii) When someone else's phrasing is uniquely appropriate and you do not wish to lose this. Excessive use of quotations for this reason indicates a lack of originality and should be avoided;
- (iii) When the person being quoted really is an authority, so that what they say counts as evidence for the truth of the claim. Students often think that their lecturers, or the authors of books their lecturers recommend, are authorities in this sense, but this is not normally the case. An example of an authoritative quotation would be the words of a cabinet member on the functioning of cabinet meetings. Normally authorities are people whose situation gives them a unique point from which to observe something.

**IF YOU ARE IN ANY DOUBT ABOUT WHETHER SOMETHING CONSTITUTES PLAGIARISM, PLEASE ASK YOUR LECTURER BEFORE YOU HAND IN YOUR ESSAY.**

## English expression

All written assignments in the School of Forestry are expected to be neat, well written and constructed, with proper punctuation and free from grammatical and spelling errors. Marks will be deducted for poor presentation. Please make sure that you have a copy of 'Writing & Report Guidelines', available from Forestry reception. The Learning Skills Centre provides excellent support to students – both international and local – through their support programme and this is highly recommended to students at any level of study. Information on assistance offered can be found at:

<http://www.uco.canterbury.ac.nz/lsc/index.php>

## Referencing and the Internet

There are two qualities, high and low, of references in written work:

- (a) The higher quality material is that which has undergone peer review, which is in the public domain and which can reasonably be expected to be able to be found in a library in perpetuity. Normally this would be placed in the list of references at the end of the article.
- (b) The lower quality is that material which has not undergone peer review, and material that is a matter of opinion. Personal communications are a good example. Normally this would be referred to in the text and details placed as a footnote at the bottom of that page.

There is no guarantee of quality of information or of permanent record for material sourced from the web. Accordingly material from web sources falls in the low quality category (b). You should place a footnote giving the specific web page address, author(s) or organization(s), and date of retrieval.

## Enrolment in courses

**When you commence lectures, double-check your academic transcript to ensure that you are attending the courses you are enrolled for. Each year, students pre-enrol for more courses than they require, or change courses – particularly at mid-year, or forget to add courses before the last date for changes. This omission is often not discovered until too late and students face failing grades.**

## School of Forestry Computer Room Rules

The Computer Room facilities are provided for your use by the School of Forestry, and the University of Canterbury.

Use of the facilities is subject to the following conditions:

- **No** food or drink is to be consumed inside the computer rooms (note sipper bottles of water are allowed);
- Computers are not to be left locked. Any computer that is left locked may be rebooted;
- You are not to use the system improperly. This includes, but is not limited to, accessing or attempting to access the system inappropriately, the use of the system to harass, the downloading and/or possession of objectionable material, use of illegal software.

In the case of a breach of the first two conditions in the first instance you will receive a verbal warning. In the second instance access will be suspended for a period of 24 hours. If a third occurrence happens access will be suspended or controlled for a longer period in consultation with the Head of School. Note for the third condition formal discipline procedures may occur. Note it is your responsibility to be familiar with the University Computer Use Policy.

Procedural and policy guidelines for postgraduate students are available from the School Administrator.

## Field Trips and Practical Courses

Field trips and practical courses are an integral and compulsory part of the Bachelor of Forestry Science and attendance and participation in all field trips is required before the degree can be awarded.

<b>1<sup>st</sup> Year</b>	Hanmer Springs General Forestry Units 1 <sup>st</sup> Aid	7-8 April to be advised to be advised
<b>2<sup>nd</sup> Year</b>	Lewis Pass/Nelson General Forestry Units 1 <sup>st</sup> Aid	25-29 August to be advised to be advised
<b>FORE 202</b>	Cass Field Station	choice of 16-19 or 19-22 April
<b>3<sup>rd</sup> Year</b>	West Coast	1-5 September
<b>4<sup>th</sup> Year</b>	North Island	20-25 April

**You will be invoiced in advance for the field trips (charges will be included on your enrolment invoice at the beginning of the year). The 1<sup>st</sup> Aid and General Forestry Units will be invoiced after the courses. If you already have a current 1<sup>st</sup> Aid certificate or General Forestry Unit standards, please present the appropriate original certificates to the School Administrator.**

### Indicative Costs:

1 <sup>st</sup> Year at Hanmer Springs	\$75 + GST
2 <sup>nd</sup> Year at Lewis Pass/Nelson	\$250 + GST
3 <sup>rd</sup> Year on West Coast	\$200 + GST
4 <sup>th</sup> Year in North Island	\$150 + GST
FORE 202 at Cass (included in the FORE 202 tuition fee)	

The School heavily subsidises transportation costs across all field trips. Please note that the cost of getting to the North Island field trip are met by students, but the subsidised costs of transportation during the field trip are met by the School.

## VACATION EMPLOYMENT

As part of the degree, all students are required to gain 90 days practical work experience in forestry, conservation or the forest industry during summer vacations. You will not graduate without this experience. Students should obtain written confirmation (signed and on company letterhead) from their employers of the period of employment and the type of work undertaken. The School's coordinator for vacation work is Assoc. Prof. Manley.

# Course Outlines

## **FORE 111            TREES, FORESTS & ENVIRONMENT**

- Content:** First semester, Mon 11-12, Tue 12-1, lab Mon 2-4 (6 weeks)
- Coordinator:** Dr. Luis Apiolaza
- Objectives:** To identify significant tree species, to consider the nature and location of the world's forests and the services they provide, and the role of sustainable forest management in achieving these services
- Syllabus:** Principles and practice of tree identification; nature and location of the world's forests – roles of forests in conservation of soil, water, and biodiversity, in amenity and recreation, and in the provision of forest products; forests and climate change; management of forests to provide the services required by the community.
- Final Exam:** Date to be advised

## **FORE 121            FORESTS AND PEOPLE**

- Content:** Second semester, Mon, Fri 11-12
- Coordinator:** to be advised
- Objectives:** To introduce the student to the historical and current relationships between societies and their forests, to examine past and current use and mis-use of forests, to consider current societal attitudes to forest use.
- Syllabus:** Hunter gatherers, the age of agriculture, deforestation, shifting agriculture, community forestry, the environmental movement, forest certification, carbon credits, biosecurity, Treaty obligations, and forest policy.
- Final Exam:** Date to be advised

## **FORE 131            TREES IN THE LANDSCAPE**

- Content:** Second semester (**Term 3 only**), Mon & Tue 6-8 pm, two Saturday field trips – dates to be confirmed but likely to be the second and fourth Saturdays of lectures
- Lecturer:** Mr Nick Ledgard and others
- Objectives:** To introduce the role of trees in the sustainable management of urban and rural areas, and their usefulness in forest production, soil conservation and amenity/recreation. To acquaint students with the rudiments of silviculture and farm forestry in preparation for more advanced forestry courses.

**Syllabus:** Use of trees in NZ compared to off-shore, species choice (native and introduced) and siting, RMA and environmental considerations, basic principles of silviculture (propagation, establishment, tending, weed control and nutrition), 'other' tree crops. Plantation/woodlot, shelterbelt management, with emphasis on multi-purpose use of trees on farms.

**Final Exam** No final exam

## **FORE 141 FOREST GROWTH AND MEASUREMENT**

**Content:** Second semester, Mon 4-5, Tue 9-10, lab Wed 1-4, including an afternoon field trip

**Lecturers:** Assoc. Prof. Bruce Manley and others

**Objectives:** To introduce the student to the philosophy and practice of forest growth and measurement

**Syllabus:** Tree and stand growth measures; growth models – history, philosophy and operation; forest and tree measurement – log measurement and forest inventory

**Final Exam:** Date to be advised

## **FORE 151 COMMERCIAL ASPECTS OF FORESTRY**

**Content:** First semester, Tue 11-12, Thu 10-11, lab Fri 2-3

**Lecturer:** to be advised

**Objectives:** To acquire an overview of microeconomic principles and apply them to commercial forest operations.  
To conduct some basic microeconomic analysis relating to forest sector issues and problems.  
To gain knowledge of introductory macroeconomic phenomenon and how it influences the forest sector.

**Syllabus:** Introduction to commercial forestry; The market economy; Elasticity; Production (supply chain, long and very long run); Consumers (end users, intermediate products, demand for factors of production); Market structures; Market regulation and institutional economics in forestry; Macroeconomics and the forest sector

**Final Exam:** Date to be advised

## **FORE 202 PLANT ECOLOGY (double-coded with BIOL 270)**

**Content:** First semester. Mon 10-11, Tue 9-10, Wed 12-1, lab  
(Note the labs are taught in three streams – recommended for BForSc students is Monday 2-5). This course also involves a field trip of four days during the autumn recess (refer to Page 17 for options).

**Lecturer:** Assoc. Prof. David Norton (coordinator) with Assoc. Prof. Dave Kelly, Dr Angus McIntosh, Assoc. Prof. Matthew Turnbull (Biological Sciences).

**Objectives:** To provide students with an introduction to theoretical issues in ecology and an overview of New Zealand ecosystems.

**Syllabus:** Principles of ecology, ecosystem ecology, physical conditions, resource uptake, nutrient and energy flows, stable isotopes

Population ecology, life histories, life tables, dispersal, mutualisms, competition, herbivory, pathogens.

Predator-prey dynamics, optimal foraging, refuge use and heterogeneity, carrying capacity, pest control. Food webs, metapopulation dynamics, keystone species.

Diversity, disturbance, succession. History of NZ ecosystems since last glaciation.

**Final Exam:** Date to be advised

## **FORE 215 INTRODUCTION TO FOREST ECONOMICS**

**Content:** Second semester, Tue 11-12, Thu 10-11, lab Mon 1-3

**Lecturer:** to be advised

**Objectives:** To acquire a broad overview of the application of economics to forestry and forestry decisions, especially in the areas of investment theory;  
To acquire some of the basic tools necessary to conduct economic analyses;  
To gain an overview of some areas of general economic theory that can be applied to problems encountered in forestry and to look at some specific current forestry issues and policies from an economic point of view.

**Syllabus:** Forestry from an economic perspective; Timber valuation; Non Market Valuation; Valuation over time; The Rotation Problem; Taxes, Royalties and other charges; Property Rights Regimes; Incorporating uncertainty, risk and inflation; Applied problems in forest management

**Final Exam:** Date to be advised

## **FORE 216 SURVEYING AND INFORMATION TECHNOLOGY IN FORESTRY**

- Content:** First semester, Mon, Thu 9-10, Fri 12-1, lab Fri 3-5
- Lecturers:** Dr Hamish Cochrane (Coordinator), Mr Roger Dawe
- Objectives:** To introduce the student to the philosophy and practice of simple surveying techniques, and the application of global positioning systems (GPS) and geographic information systems (GIS).
- Syllabus:** Distance and angular measurement, differential levelling, area calculation; introduction to photogrammetry, global positioning systems (GPS) and geographic information systems (GIS)
- Final Exam:** Date to be advised

## **FORE 218 FOREST ECOSYSTEM HEALTH**

- Content:** First semester Mon, Wed, Thu 11-12, lab Thu 1-4
- Lecturers:** Dr Hamish Cochrane (Coordinator), Assoc. Prof. David Norton
- Objectives:** Introduce students to the natural history of New Zealand, provide basic knowledge on the management of forest health and introduce the taxonomy of tree species
- Syllabus:** Natural history of New Zealand; Science and management of forest pests, disease, wind, fire, biosecurity and risk; Systematic botany of New Zealand indigenous forest species and the major trees of the world
- Final Exam:** Date to be advised

## **FORE 219 INTRODUCTION TO SILVICULTURE**

- Content:** Second semester Mon 10-11, Tue 9-10, Wed 12-1
- Lecturer:** Assoc. Prof. Euan Mason and others
- Objectives:** To provide a biological background to the study of Silviculture.
- Syllabus:** Physiology; NZ model of forestry; Classical systems, seed tree and clearcutting; Selection, shelterwood and vegetative systems; Modelling for natural forest management; NZ forest cover; Beech forests autecology/synecology; Beech forest management; Mixed podocarp-hardwoods/other hardwoods; Invertebrate conservation; Mainland islands; Tree breeding and genetics
- Final Exam:** Date to be advised

## **FORE 222                    BIOMETRY IA (double-coded with STAT 222)**

**Content:** First semester, Tue and Wed 1-2 pm, 1 lab in alternate weeks. (Note, you must book online for the lab – choice of 11 am, 12 noon, 1 pm and 2 pm, with the 12 noon and 1 pm filling up first). The recommended time slots for BForSc students are 12 noon and 1 pm. The likely web link to book for the lab is:

<http://www.math.canterbury.ac.nz/php/resources/tools/tutorials/enrolment>

**Lecturers:** Coordinator: Dr Carl Scarrott  
Dr Marco Reale, Dr John Newell – Maths & Statistics

**Objectives:** To demonstrate, on real data/problems, a range of statistical techniques which are widely used within industry. All stages of statistical analysis will be studied. As a core component there is a focus on experimental design, sampling, analysis and critical evaluation of findings.

**Syllabus:** Experimental Design  
Sampling methods  
Analysis of Variance  
Hypothesis testing  
Use of statistical software

**Final Exam:** Date to be advised

## **FORE 224                    BIOMETRY IB (double-coded with STAT 224)**

**Content:** Second semester, Tue and Wed 1-2 pm, 1 lab in alternate weeks. (Note, you must book online for the lab – choice of 11 am, 12 noon, 1 pm and 2 pm, with the 12 noon and 1 pm filling up first). The recommended time slots for BForSc students are 12 noon and 1 pm. The likely web link to book for the lab is:

<http://www.math.canterbury.ac.nz/php/resources/tools/tutorials/enrolment>

**Lecturers:** Coordinator: Dr Carl Scarrott  
Dr Carl Scarrott – Maths & Statistics, Assoc Prof Euan Mason, Dr Luis Apiolaza

**Objectives:** Regression models are widely used statistical tools for examining the relationships between variables. This course will provide a practical introduction to the fundamentals of regression modelling.

**Syllabus:** Simple linear regression and correlation  
Multiple regression  
Inference for regression models  
Model selection  
Use of statistical software

**Final Exam:** Date to be advised

**NB:** For both FORE 222 and FORE 224, refer to the following web sites for detailed information on the papers:

<http://www.math.canterbury.ac.nz/stat222>

<http://www.math.canterbury.ac.nz/stat224>

## **SOIL 203**

## **SOIL FERTILITY**

**Content:** Second semester, Mon, Wed, Thu, 9-10, lab Tue 2-5

**Lecturer:** Dr John Adams

**Objectives:** Students will develop an understanding of: soil properties which are important to sustainable land use and environmental protection including soil formation, soils in the New Zealand landscape, soil physical properties, soil nutrient availability, nutrient cycling and assessment of soil fertility.

**Syllabus:** Basic soil properties; soil formation and soils in the New Zealand landscape; soil chemical and physical properties which are important to sustainable land use and environmental protection; assessment and correction of soil nutrient availability, particularly with respect to forests.

**Final Exam:** Date to be advised

## **FORE 305\***

## **FOREST ENGINEERING**

**Content:** First semester, Mon 12-1,2-4, Tue 3-4, Thu 10-11, Wed f.t. 10-5

**Lecturer:** Mr Ron O'Reilly

**Objectives:** To introduce the student to engineering aspects of forestry and environmental and safety aspects of forestry operations.

**Syllabus:** Forest roading and forest layout; forest harvesting methods and systems; environmental and safety aspects of forestry operations; the Resource Management Act and the Occupational Safety and Health Act; forest hydrology; harvest planning; mechanisation and costing of harvesting operations; transfer of power; machine capability calculations

**Final Exam:** Date to be advised

## **FORE 307\***

## **PLANTATION SILVICULTURE**

**Content:** First semester, Mon 10-11, Tue 9-10, 12-1, 4-5, Wed f.t. 10-5

**Lecturer:** Assoc. Prof. Euan Mason

**Objectives:** To understand the principles and tools associated with decision-making in plantations at a stand level.

**Syllabus:** Factors which influence forest product quality and value, effects of site quality, genetics and management. Review of pre-harvest inventory. Log grades and recovery.  
Discounted cash flow as a tool for evaluating silvicultural regimes. Costs of operations.  
Species choice, tree breeding, and an outline of stand-level modelling.

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\* Field trips for FORE 305 and 307 will be on different dates and will not cause real timetable clashes.

Effects of rotation length on product quality. Ways of choosing rotation length, risk.

The final crop stocking. Effects of final crop stocking on crop dimensions, interaction with rotation length. Site occupancy, biomass.

Thinning and pruning schedules, silvicultural regimes, software tools for modelling tending regimes.

Establishment of plantations, nursery systems, site manipulation, fertilisation, decision-support systems.

Forest Protection, risk revisited.

Influences of site, planning silvicultural regimes to meet objectives.

Silviculture of alternative species.

**Final Exam:** Date to be advised

## **FORE 316 FOREST MANAGEMENT**

**Content:** Second semester, Mon 12-1, Tue 10-11, Wed 9-10, Fri 10-11, labs Tue 2-5, Fri 1-4

**Prerequisites:** Students who are not doing this course as part of the BForSc degree or the Postgraduate Diploma in Forestry are required to have any Maths at the 100 level.

**Lecturers:** Assoc. Prof. Bruce Manley

**Objectives:** The objective of this course is to provide students with an understanding of (and the ability to apply) the concepts, data requirements, techniques, and systems used to support forest management decision-making. The course follows the definition that forest management is “the study and application of analytical techniques to aid in choosing those management alternatives that contribute most to organisational objectives” (Leuschner, 1984).

Students who successfully pass this course will understand:

- Basic operations research techniques
  - Information requirements for forest management planning
  - Concepts of forest management planning
  - Forest management decision support systems
- Be able to apply these in analyses to support forest management decision-making
- Be able to effectively communicate the results of these analyses

**Syllabus:** Operations Research techniques for forest management.  
Information requirements for forest management planning.  
Stand level analysis.  
Forest estate level analysis.  
Integration of the forest estate with manufacturing and marketing decisions.  
Tactical harvest planning.  
Other issues

**Final Exam:** Date to be advised

## **FORE 327                      WOOD SCIENCE**

**Content:** Second semester, Mon 10-11, 2-3; Tue 11-12, Thu 8-9, 10-11; lab Thu 1-4 (for nine weeks).

**Lecturer:** Prof. John Walker

**Objectives:** The course aims to develop the subject systematically and in an integrative manner. Wood anatomy, chemistry and ultrastructure are first considered, as are the crucial interactions in the wood-water system, and the consequences of forestry practice. Only then are the technologies of the wood processing industries explored. Thus the vital link between wood properties and technological needs of products and processes is recognised – as is the dilemma that products call for ever-increasing uniformity and yet there is extreme variation in wood quality.

**Syllabus:** The first 25% of the course focuses on wood science (wood anatomy, wood chemistry and wood physics) and its implication for silviculture and forest management. Then the salient features of sawmilling and solid wood processing in general (40%), of panel products (15%), of pulp & paper (15%), and the energy sector (5%) are examined in turn. The reasons for processing material in a particular way are explained. The approach is not prescriptive and alternative ideas/technologies are discussed.

There is a mix of laboratory periods and visits to industrial operations, to see how much of industry ticks, to observe wood flows through mills and to compare existing equipment and performance with state of the art options (covered in lectures). Almost all visits are within 7 km of the University. While the School offers limited transport in its 10 seater van, students have traditionally pooled their vehicles and shared costs. Stout footwear is essential.

**Final Exam:** Date to be advised

## **FORE 410                      ADVANCED BIOMETRICAL METHODS IN FOREST AND BIOLOGICAL RESEARCH**

**Content:** Second half year  
**Note:** This course will not be offered unless there is a minimum of 10 students enrolled.

**Lecturers:** Dr Richard Woollons (Forestry)

**Objectives:** To apply statistical methodologies to forestry and biological datasets, with a view to interpreting and understanding output.

**Syllabus:** Various regression techniques, analysis of variance and covariance.  
Non-linear and logistic regression.  
Aspects of experimental design  
Multivariate analysis, principal components, canonical correlation, discriminant analyses, other multivariate techniques.  
Graphical techniques.

## **FORE 414                    DISSERTATION**

**Content:** Whole Year. Students join FORE 610 lectures Mon 2-4 in 2<sup>nd</sup> Term only.  
The dissertation is essentially an independent study of any topic within the broad disciplines of forestry. The topic is chosen by the student, in consultation with the dissertation coordinator and the faculty adviser. The student meets with the dissertation coordinator early in the term and then with the adviser as needed.

**Coordinator:** Mr Ron O'Reilly

**Objectives:** To develop and apply research skills including the art and science of defining a research topic, data collection and analysis, presentation of data and results, interpretation and application of research results; to synthesize professional training and experience to date in the production of an original research paper of professional standard.

**Syllabus:** There is no set syllabus.

## **FORE 419                    MANAGEMENT CASE STUDY**

**Content:** Terms 1 - 2, Mon 10-11, Tue 9-10, Fri 10-11 and a field trip.  
Term 3, Mon 9-10, Tue 12-1, Thu 9-10

The field trip to the case study client will be advised at the commencement of the course.

**Coordinator:** Assoc. Prof. Bruce Manley

**Objectives:** To synthesise previous coursework and fieldwork in order to independently analyse and report on a specified forest management problem for a New Zealand client. The exercise will incorporate ecological, silvicultural, financial and market realities.

To successfully communicate that plan in both written form and orally to the client.

**Syllabus:** Case Study requires students to act as consultants to the client. Terms of Reference will detail the issues that the client wishes the consultants to address. The consultants are then required to bring together information (of a wide range of types, quality and completeness), analyse this information and make recommendations on decisions to be made by the client.

The Terms of Reference will involve a number of tasks within an overarching theme. These tasks could involve all or any of the following:

- Regional resource description: the forest resource in the region.
- Market research: demand in various markets for potential products from the resource.
- Forest description: description of land, forest area, stand history, current crop, yield estimation, croptyping.
- Stand simulation: development of alternative management options.
- Forest estate modelling: strategic plan formulation and evaluation.
- Tactical harvest planning: development of 3-5 year plan to schedule stands for harvest.

- Forest valuation: comparable sales, discounted cashflow analysis.
- Manufacturing: identification of downstream processing opportunities for the resource
- Sustainability: certification of sustainable forest management
- Non-wood values: provision (and valuation) of non-wood uses of the estate such as recreation
- Presentation techniques: analysis of effective oral presentation techniques; report writing.

## **FORE 422**

## **FOREST HARVEST PLANNING**

- Content:** First semester, Tue 10-12, Thu 1-3. Field trips during the term will be included (Tuesdays 10-5).
- Lecturer:** Mr Ron O'Reilly
- Objectives:** To enable the student to become proficient at identifying and analysing forest harvesting options; to introduce analytical methods developed to determine the productive capacity of harvesting systems; to present the opportunity for the student to integrate the many factors which need to be considered when developing harvesting plans.
- Syllabus:** The role and aim of harvest planning; review of harvesting systems and their characteristics; landing layout and loading; costing; mechanisation; aerial systems; wood flow planning and control; development of a harvesting plan; harvest scheduling; labour management.
- Final Exam:** Date to be advised

## **FORE 423**

## **FOREST TRANSPORTATION PLANNING**

- Content:** Second semester, Thu 11-1, Wed lab/f.t. 1-5
- Lecturer:** to be advised
- Objectives:** To give the student an understanding of, and experience in road location and design, including acquiring extensive knowledge of the RoadEng road location software package; to investigate how road design influences vehicle performance; to become acquainted with the regulations regarding various truck configurations and payloads; and to understand some of the geotechnical (soils engineering) aspects of forest roading.
- Syllabus:** Regulations; road location, design and construction; geometric design; contracts; earthwork volume calculations; engine selection; soil classification for engineering purposes; "pavement" design; soil stabilisation; compaction; culvert installation; sediment mitigation methods.

## **FORE 426**

## **MARKETING AND INTERNATIONAL TRADE IN FOREST PRODUCTS**

**Contact:**

First semester, Mon 1-2, 4-5, Thu 3-5, Fri lab 1-3 lab

**Lecturer:**

Dr Robert Donnelly

**Objectives:**

The objectives of the course are to provide an understanding of marketing and international trade in forest products, outlining the strategic importance, following an introduction to the current marketing environment.

**Syllabus:**

**Introduction:** Organisational perspectives for marketing, the nature of the products (product life cycle), globalisation for the forest products industry and major export markets, marketing case studies, New Zealand perspective;

**International trade commodities and trade flows:** roundwood, chips, sawn timber, plywood, particle board and fibre board, market pulp, waste paper, newsprint and groundwood printing papers, other paper and paperboard;

**Review of marketing related to New Zealand forest products:** product characteristics - industrial commodities versus consumer products, product-market selection, product innovation and "niche" marketing product life cycles, distribution channels and transportation, price determination, marketing-promotion, marketing myopia and creativity;

**Future international trade strategy for New Zealand:** future world demand for wood products, future world wood supply (regional), cost factors (regional influencing wood supply development versus competitors), consideration of strategic development prospects for New Zealand forest products industry related to Australia, Japan, W. Europe, N. America and E/SE Asia.

## **FORE 435**

## **FOREST ECONOMICS 2**

**Content:**

***May not be offered in 2008***

Second semester, Mon, 4-5, Tue 9-10, lab Thu 5-6

**Lecturer:**

to be advised

**Objectives:**

To provide students with applied skills in the analysis of forest product markets, and to introduce them to advanced concepts in forest economics.

**Syllabus:**

- Econometric analysis and forecasting of log, lumber and stumpage markets
- Forest capital theory and timberland investment strategies
- Microeconomics of forest production and processing

## **FORE 436**

## **FOREST TREE BREEDING**

**Content:**

First semester, Wed 9-10, Fri 11-1

**Lecturer:**

Dr Luis Apiolaza

**Objectives:**

To understand the principles of tree breeding and of tree propagation.

**Syllabus:**

Tree propagation techniques (seed, cuttings, somatic embryogenesis) and tree breeding theory and practice (provenance, genotype and phenotype, genetic gain,

GE interactions, progeny trials, seed orchards, clone banks, early to late age correlations, early flower induction, marker-aided selection, physiological testing and modelling, genetic modification.

## **FORE 441                      ENGINEERED WOOD PRODUCTS**

**Content:**                      **Not offered in 2008**

**Coordinator:**              Assoc Prof Shusheng Pang (CAPE)

**Lecturer:**                      Dr Kelvin Chapman, Assoc Prof Shusheng Pang, Dr Mark Staiger

**Objectives:**              The objective of the course is to develop an awareness of composite as an increasing outlet for the forest resource, and of the technology and the wood requirements necessary to make these products. Additionally, the course will provide a brief overview of the pulp and paper industry

**Syllabus:**                      The course will review the general technology of composites, and focus on the wood based composite field, moving to a more detailed examination of the significant wood based composites produced in NZ (plywood, particleboard and MDF), and other composites which are not yet produced in NZ. The product and process requirements will be considered in terms of: wood chemistry and structure, wood requirements, wood preparation, resin technology, presses (particularly continuous press technology), panel performance requirements and test procedures, and environmental impacts of both products and processes. Practical requirements will be based on plant visits to local MDF and plywood plants, and on laboratory periods undertaking panel tests, and panel making.

## **FORE 442                      APPLICATION OF INFORMATION TECHNOLOGY IN FORESTRY**

**Content:**                      Second semester, Mon, Tue 1-2, Wed 12-1; lab Mon 3-5

**Lecturers:**                      Dr Hamish Cochrane

**Objectives**                      The course is designed to illustrate how information technology can be applied to a range of forest management problems. It builds upon the Forest Measurements courses (FORE 141 and 216), integrating material covered in other Year 3 and Year 4 forestry courses, providing examples of applications in the range of forestry disciplines. Extensive use of ArcView GIS software is made.

**Syllabus**                      (1) a discussion of a range of forest management situations to which information technology can be applied, including conservation management, forest biosecurity management, forest inventoring, forest roading, forest harvesting, forest asset management, product transportation and logistics, and product chain of custody, (2) the teaching of the software and hardware skills required to analyse and solve spatial problems in forest management, and (3) work on the successful application of information technology including ArcView GIS software and GPS technology to such problems. The division of the course into three sections allows students to gain experience in developing critical analyses for the application of the technology to typical problems.

## **FORE 443                    BIOSECURITY RISK MANAGEMENT**

- Content:** Second semester, Tue 9-10, Wed 12-1, Fri 9-10
- Lecturer:** Dr Hamish Cochrane
- Objectives:** To provide students with an advanced understanding of the issues which underlie the management of biosecurity for New Zealand.
- Syllabus:** Biological threats to industry, environment and health; management approaches to biosecurity; risk management in biosecurity; emerging biological threat

## **FORE 444                    SUSTAINING BIODIVERSITY ON PRIVATE LAND**

- Content:** Second semester, Mon, Tue 11-12, Fri 10-11; lab Fri 2-5 **TERM 3 ONLY**
- Lecturer:** Assoc. Prof. David Norton (Forestry), Dr Jason Tylianakis (BIOL)
- Objectives:** Students will have an understanding of biodiversity management on private production land. Students will understand biodiversity management at a catchment and regional level. Students will have an understanding of national biodiversity goals and planning.
- Syllabus:** Background – introductory case studies, policy context and philosophy of land management, introduction to agricultural and plantation systems, ecological and human histories in production systems; Resilience and social context; Policy tools; Management tools
- Final Exam:** Date to be advised

## **FORE 445                    ENVIRONMENTAL FORESTRY**

- Content:** Second semester, Mon, Tue 11-12, Fri 10-11; lab Fri 2-5 **TERM 4 ONLY**
- Lecturer:** Assoc. Prof. David Norton
- Objectives:** Students will have an understanding of the reasons for and the skills necessary to manage environmental values within plantation forestry systems. In particular students will have a solid grounding in the requirements of regulatory and market incentive (certification) systems for sound environmental management based on practical case studies.
- Syllabus:** Introduction – regulatory requirements and certification systems, key environmental values associated with plantation forests, threats to environmental values; Resource consent case study; Certification case study
- Final Exam:** No final exam

**Postgraduate timetables will be available at the start of each semester. Refer initially to lecture hours for the co-taught 400 level papers. Extra lecture hours/tutorials will be arranged once enrolments are known.**

## **FORE 604                    ADVANCED FOREST TREE BREEDING & GENETICS**

- Content:** First Semester
- Lecturer:** Dr Luis Apiolaza
- Objectives:** To understand the principles of tree breeding and of tree propagation.
- Syllabus:** Tree propagation techniques (seed, cuttings, somatic embryogenesis) and tree breeding theory and practice (provenance, genotype and phenotype, genetic gain, progeny trials, seed orchards, clone banks, early to late age correlations, early flower induction, marker-aided selection, physiological testing and modelling, genetic modification. Breeding trees for purpose (e.g. wood quality, volume production, disease resistance), economic aspects of tree breeding, deployment, hybridization, inbreeding, GE interactions, transgenic trees.

## **FORE 606                    FOREST TRANSPORT**

- Content:** Second semester
- Lecturer:** to be advised
- Objectives:** The focus of the course is the *delivery* phase of forest operations, where raw forest products are moved from roadside to mill or port. The objective of the course is to develop a view of forest transportation from the systems perspective, drawing in the elements of engineering and planning that are needed to produce viable forest transportation systems.
- Syllabus:** Regulations pertaining to forest trucking; road location, design and construction; road geometric design; contracts, construction supervision, earthwork volume calculations; strengthening forest roads; road management systems; truck/road interaction; truck specifications and allowable loads; truck scheduling, logistics, network analysis; alternative transportation methods in forestry.

The course makes use of RoadEng and ArcView GIS software.

## **FORE 607                    FOREST HARVESTING**

- Content:** First semester
- Lecturer:** Mr Ron O'Reilly
- Objectives:** To present the opportunity for students to become familiar with analytical methods to determine the productive capacity of harvesting systems, and to be able to integrate the many factors which need to be considered in planning and controlling harvesting operations.

**Syllabus:** Review of harvesting systems and their characteristics; logging planning, productivity determination and costing approaches; wood flow planning and control; application of decision-making techniques in harvesting; development of harvesting plans; labour management.

## **FORE 609                      ADVANCED WOOD-BASED COMPOSITES**

**Content:** *Not offered in 2008*

**Lecturer:** Assoc. Prof. Shusheng Pang (CAPE), Dr Kelvin Chapman and others

**Objectives:** To develop an awareness of the manufacture and use of composite wood products as an increasingly important outlet for the forest resource.

**Syllabus:** The course provides an overview of the place of wood-based composites as an increasingly important part of the wood utilisation industry.

The course will consider the advantages of composite technology as a viable solution to material limitations in both natural and manufactured products, and draw from this the reasons for the development of wood-based composites as a solution that maximises the use of the forest resource. A generalised composite model is described in terms of particle size and orientation, and adhesive systems. The range of wood-based composites which have been commercially successful are drawn from this model, with particular focus on those which have been successful in the New Zealand market. The manufacture of these is discussed in terms of raw material, process equipment requirements and environmental impacts.

The performance of composite panels is considered in relation to market requirements, and from an environmental perspective. Practical requirements will include panel manufacture and testing, and visits to local panel manufacturing plants.

## **FORE 610                      RESEARCH METHODS**

**Content:** First semester, times to be advised

**Lecturers:** Assoc. Prof. Euan Mason and others

**Objectives:** To assist students in planning research project and in designing and analysing appropriate experiments.

**Syllabus:** History of the philosophy of science; research planning, bibliographic skills, writing skills, presenting papers at conferences, research planning, statistics and experimental design.

## **FORE 612                    ADVANCED FOREST FINANCE**

- Content:** First semester
- Lecturer:** *May not be offered in 2008*
- Objectives:** To provide students with advanced skills in applied forest economics and finance. Focus will be on the analysis of forest product markets
- Syllabus:**
- Econometrics of lumber and timber markets
  - Analysis of timberland investments
  - Advanced microeconomics of forest production and processing

## **FORE 613                    STRATEGIC                    MARKETING                    IN                    FOREST                    PRODUCTS**

- Content:** First semester
- Lecturer:** Dr Robert Donnelly
- Objectives:** The objectives are to understand basic forest commodity products, review of product-market alternatives and life cycles, review international forces at play in the global forest products industry, such as distribution and certification, and to evaluate current marketing environment, and gain an appreciation of strategic marketing.
- Syllabus:**
- Introduction to marketing and organisational issues; increasing globalisation, locating major export markets, case studies and New Zealand perspective.
- International trade component of commodities and trade flows.
- Product -
- market combinations to include: roundwood, chips, sawn timber /reman
  - products, panel products, engineering products, market pulp and paper products, including paperboard products.
- Evaluate marketing related to New Zealand and other countries = forest products. Review product distribution and the various channels particularly the D.I.Y. (do-it yourself) segment. Evaluate product life-cycle and product pricing in the value-chain, marketing promotion and marketing myopia versus creativity for commodities.
- Strategic marketing evaluation of alternatives for New Zealand and other countries, primarily in the southern hemisphere. Consider future world wood supply, cost factors, comparative advantages and strategic development prospects with focus on Australia, Japan, U.S., other Asia and Europe.

## **FORE 614                    PROCESSING**

**Content:**                    Second semester

**Lecturer:**                Prof. John Walker

**Objectives:**            The course aims to develop the subject systematically and in an integrative manner. Wood anatomy, chemistry and ultra structure are first considered, as are the crucial interactions in the wood-water system, and the consequences of forestry practice. Only then are the technologies of the wood processing industries explored. Thus the vital link between wood properties and technological needs of products and processes is recognised - as is the dilemma that products call for ever-increasing uniformity and yet there is extreme variation in wood quality.

**Syllabus:**                The first 25% of the course focuses on wood science (wood anatomy, wood chemistry and wood physics) and its implication for silviculture and forest management. Then the salient features of sawmilling and solid wood processing in general (40%), of panel products (15%), of pulp & paper (15%), and the energy sector (5%) are examined in turn. The reasons for processing material in a particular way are explained. The approach is not prescriptive and alternative ideas/technologies are discussed.

There is a mix of laboratory periods and visits to industrial operations, to see how much of industry ticks, to observe wood flows through mills and to compare existing equipment and performance with state of the art options (covered in lectures). Almost all visits are within 7 km of the University. The School offers limited transport in its 10 seater van. Students have traditionally pooled their vehicles and shared costs. Stout footwear is essential.

## **FORE 616                    RESTORATION ECOLOGY**

**Content:**                    Second semester. 12 Seminar sessions, times to be advised

**Lecturer:**                Assoc. Prof. David Norton

**Objectives:**            Detailed examination of issues associated with the effects of habitat fragmentation on indigenous biodiversity, the use of restoration as a means to reverse these effects, and the integration of biodiversity conservation into sustainable land management in rural New Zealand.

**Syllabus:**                Topics covered are likely to include the following:

- Edges and corridors – are they important?
- Effects of fragmentation on ecosystem processes.
- Debate: Should we bother protecting small remnants?
- Introduction to restoration ecology.
- Is it possible to restore natural ecosystems?
- Is species origin important for restoration?
- Assembly rules and restoration ecology.
- How can we assess restoration success?

## **FORE 624                      PLANTATION SILVICULTURE**

- Content:** First semester
- Lecturer:** Assoc. Prof. Euan Mason
- Objectives:** To understand the principles and tools associated with decision-making in plantations at a stand level, and to develop an in-depth knowledge of a specific aspect of silviculture
- Syllabus:** Site quality, genetics and management. Pre-harvest inventory, log grades and recovery.  
Discounted cash flow and costs of operations.  
Species choice, tree breeding, stand-level modelling.  
Rotation length, product quality, risk.  
Stocking, thinning, pruning, tending, silvicultural regimes  
Plantation establishment, nursery systems, site manipulation, fertilisation, decision-support systems.  
Forest Protection

## **FORE 641                      PLANTATION FOREST MANAGEMENT**

- Content:** Second semester
- Lecturer:** Assoc. Prof. Bruce Manley
- Objectives:** The objective of this course is to provide students with an understanding of (and the ability to apply) the concepts, data requirements, techniques, and systems used to support forest management decision-making.
- Syllabus:**
- Operations research techniques
  - Information requirements for forest management planning
  - Concepts of forest management planning
  - Forest management decision support systems
  - Stand level analysis
  - Forest estate level analysis
  - Application for forest management, investment analysis and forest valuation
  - Integration of the forest estate with manufacturing and marketing decisions

## **FORE 642                      ADVANCED IT APPLICATIONS IN FORESTRY**

- Content** Second semester
- Lecturer** Dr Hamish Cochrane
- Objectives** The course is designed to illustrate how information technology can be applied to a range of forestry management problems. It assumes an elementary level of understanding in forest measurement and GIS and integrates material covered in senior undergraduate forestry courses, providing examples of applications in the range of forestry disciplines. Extensive use of ArcView GIS software is made.
- Syllabus** The course contents are arranged in three sections: (1) a discussion of a range of forest management situations to which information technology can be applied,

including conservation management, forest biosecurity management, forest inventorying, forest roading, forest harvesting, forest asset management, product transportation and logistics, and product chain of custody; (2) the teaching of the software and hardware skills required to analyse and solve spatial problems in forest management; and (3) work on the successful application of information technology including ArcView GIS software and GPS technology, to such problems. The division of the course into three sections allows students to gain experience in developing critical analyses for the application of the technology to typical problems.

## **FORE 643                    MODELLING FOR MANAGEMENT (WEB-BASED COURSE)**

- Content:** First semester
- Lecturer:** Assoc. Prof. Euan Mason, Prof. Jerry Vanclay, Assoc. Prof. Bruce Manley, Dr Richard Woollons
- Objectives:** To provide managers and novice researchers with a comprehensive introduction to the techniques employed when creating models for forest management.
- Syllabus:** Introduction, SAS software, data requirements and management, taper & volume equations, models for single species and even-aged stands, models for all aged and mixed species stands, modelling regeneration, estate modelling, applications of models.

## **FORE 665                    PEST MANAGEMENT & BIOLOGICAL SECURITY**

- Content:** Second semester
- Lecturers:** Dr Hamish Cochrane
- Objectives:** To provide students with an advanced understanding of the issues which underlie the management of biosecurity for New Zealand.
- Syllabus:** Integration of pest management in conservation and production planning. Development of principles of invasive species and the impact of invasive species in environmental, economic and social contexts.

## **FORESTRY STUDENTS SOCIETY (FORSOC)**

FORSOC was initially established during the first School of Forestry (1924-1932) and re-established following the opening of the present school in 1970.

The objectives of FORSOC are to provide a club to foster social interaction for students and staff and to advance the aims and ideals of the forestry profession. Further, FORSOC publishes annually a student magazine "Te Kura Ngahere". A committee to run FORSOC will be elected at the beginning of the year from all four forestry years. To join please watch the notice boards in the School of Forestry at the beginning of the first term.

## **NEW ZEALAND INSTITUTE OF FORESTRY (NZIF)**

The New Zealand Institute of Forestry is a national organisation of people involved in all aspects of the discipline of forestry. Incorporated in 1927, the Institute now has about 800 members from government, industry, research, academic and consulting fields; it provides a professional umbrella for those involved in forest management, whether it be management of natural forests or plantations, for forest products, recreation, wildlife or natural habitat, or soil and water protection. The Institute's philosophy and forest policy is that forestry is conservation; in the words of the New Zealand Conservation Strategy, "Conservation is the management of human use of the biosphere to yield the greatest sustainable benefits to present generations while maintaining potential to meet the needs and aspirations of future generations." Conservation management of forests thus include preservation, maintenance, sustainable utilisation, restoration and enhancement of the forests and forest environment.

The objectives of the Institute are to serve members by:

- \* affording them opportunities to express and exchange views
- \* overseeing members ethics
- \* encouraging fraternity and "Esprit de corps"
- \* providing recognition of professional standards
- \* the publication of the Journal of New Zealand Forestry.

The Institute is structured into local sections that hold meetings and field days. FORSOC is affiliated to the Institute and is invited to participate in the Canterbury local section activities. **Those who wish to join the Institute as student members can do so by contacting Ron O'Reilly or Euan Mason.**

### PERSONAL TIMETABLE

	<b>Mon</b>	<b>Tue</b>	<b>Wed</b>	<b>Thu</b>	<b>Fri</b>
<b>8-9</b>					
<b>9-10</b>					
<b>10-11</b>					
<b>11-12</b>					
<b>12-1</b>					
<b>1-2</b>					
<b>2-3</b>					
<b>3-4</b>					
<b>4-5</b>					