

New Zealand School of Forestry  
College of Engineering

# Forestry Student Handbook



12



University of Canterbury

**New Zealand School of Forestry**

**Student Handbook**

**2012**

*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.*

# Contents

	<b>Page No</b>
The School in 2012	3
Staff, Industry Appointments, and others	4
Degree Schedules	6
Assessment	11
Mentoring Programmes	17
Code of Student Conduct	17
Field Trips, Practical Courses, Safety Equipment and Vacation Employment	18
Course Outlines	20
FORSOC	39
NZ Institute of Forestry	39
Timetables by Academic Year	40

# The School of Forestry in 2012

The School of Forestry aims to produce forestry graduates of the highest calibre who can manage a range of forests and other natural resources. We provide a focused forestry programme that is relevant to employers. We know this because employers tell us so – our students are sought not only by New Zealand forestry organisations but also internationally. The shortage of forestry graduates in Australia means that Canterbury students who have completed studies over the past five years have been recruited by forestry companies in Queensland, New South Wales, Victoria, South Australia and Western Australia. However, because of opportunities in New Zealand, most stay here.

The School has a graduate profile that identifies what we are trying to achieve. This states that the “Forestry Science programme aims to provide students with the appropriate academic base and practical work experience from which they can develop into effective professional foresters.” Students are required to gain 90 days practical work experience in commercial or conservation forestry or the wider forestry sector during University breaks.

The practical work requirement is designed to give:

- practical and professional work experience;
- experience in applying the skills learnt at the School of Forestry;
- connection with the broader forest sector;
- an understanding of potential career pathways within the sector; and
- additional experience at report writing.

We recently reviewed the practical work requirements for the BForSc degree. While the 90-day requirement has been left unchanged, we have added requirements around composition and reporting. Under the changes, a student is required to complete at least 90 days of work experience, which should consist of:

- A section of 30 days of manually oriented work experience;
- A section of 30 days of professionally oriented work experience (the focus is on applying academic training in a practical situation); and
- The remaining 30 days may be made up of either manual or professional work experience.

Students are required to submit two written reports, one normally being linked to manual experience, and one to professional practice. These changes are designed to enhance what our students learn from work experience and apply to students who commenced the degree from 2011 onwards. Students who commenced the degree prior to 2011 should confirm the reporting requirements with the School Coordinator.

We have now fully implemented the new university-wide 15-point course structure for courses. The main changes affected core Year 3 papers: Plantation Silviculture; Forest Management; and Wood Science which expanded to 30 point courses. This gave us the opportunity to add some additional topics within these papers. For example, the School of Forestry Advisory Board recommended that our graduates should be taught more about “Human Factors” – topics such as the role and style of leadership; communication; motivation; team work; and problem solving. Consequently we have added a specialist module to Forest Management to cover this.

As part of the new structure we have better integrated field trips into the curriculum. BForSc students have at least one compulsory field trip in each of the four years of the degree. Each field trip is now linked to a specific course:

- Year 1 – 2 days at Hanmer (FORE 141- Forest Growth & Measurements)
- Year 2 – 5 days at Harihari and Boyle River (FORE 218 – Forest Biology)
- Year 2 – 2 days at Maruia (FORE 219 Introduction to Silviculture)
- Year 3 – 5 days at Nelson (FORE 307 – Plantation Silviculture)
- Year 4 – 5 days (FORE 419 – Management Case Study)

The field trips are a highlight of the degree – not only are they great learning experiences, they also provide plenty of shared experiences to develop friendships that last for life.

Bruce Manley

## Staff

### Professor & Research Fellow

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 Lecturers

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

Tree breeding; Quantitative genetics

D.C. Evison, B.A., B.For.Sc.(Hons), Ph.D.(Wash)

Forest economics

### Lecturer

C. Altaner, Diplom Holzwirtschaft (Hons) (Hamburg), PhD (Hamburg)

Wood quality

J. Morgenroth, B.Sc., M.F.C., Ph.D. (Cant)

Urban Forestry, GIS

T. Murray, B.Sc., M.Sc. (Mass), Ph.D. (Lincoln)

Entomology, biotic diversity and multi-trophic interactions, biodiversity and species  
interactions

### Assistant Lecturer

S.D. Fairbrother, B.E.(Hons)(Forest Engineering)

Forest road engineering; Harvest planning; Collection and utilisation of forest biomass for thermal  
power generation

### Research Fellow

M. Bloomberg, B.For.Sc., Ph.D. (Lincoln)

Forest-sale site assessment; forest ecophysiology; silvicultural systems; forest modelling;  
agroforestry and forest influences (shelter and forest microclimates); tropical forestry

## **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

## **Adjunct Senior Fellows**

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

Soils and tree nutrition

N. Ledger, QSO, B.Sc. (Auckland), M.Sc. (Bangor)

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

## **Industry Appointments**

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

Marketing; International trade

## **Adjunct Teaching Staff**

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

Vertebrate pest impacts

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

Forest Hydrology

A. Griffiths, B.For.Sc.

Management of indigenous forests

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

Tree physiology; Soil science; Silviculture

## **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

### 1<sup>ST</sup> YEAR (Canterbury)

BIOL 112	Ecology, Evolution & Conservation
BIOL 113	Diversity of Life
Chemistry	15 Points at the 100 level (CHEM114 recommended)
FORE 111	Trees, Forests and the Environment
FORE 131	Trees in the Landscape
FORE 141	Forest Growth and Measurement
FORE 151	Commercial Aspects of Forestry
STAT 101	Statistics I

Plus: 1) 1<sup>st</sup> Year Field Trip to Hanmer Springs; and 2) General Requirements Unit Standards Training

### 2<sup>ND</sup> YEAR

FORE 205	Introduction to Forest Engineering
FORE 215	Introduction to Forest Economics
FORE 218	Forest Biology
FORE 219	Introduction to Silviculture
FORE 222	Biometry 1A
FORE 224	Biometry 1B
SOIL 203	Soil Fertility

Plus: 1) FORE 218/2<sup>nd</sup> Year Field Trip to Boyle River and HariHari; 2) FORE 219 Field Trip to St Arnaud

### 3<sup>RD</sup> YEAR

FORE 307	Plantation Silviculture
FORE 316	Forest Management
FORE 327	Wood Science
FORE 342	Geospatial Technologies in Forestry

and one further subject from the Option Schedule

Plus: FORE 307/3<sup>rd</sup> Year Field Trip to St Arnaud

### 4<sup>TH</sup> YEAR

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

and four further subjects from the Option Schedule

Plus: 4<sup>th</sup> Year Field Trip to either North or South Island – linked to Case Study client where possible

### OPTION SCHEDULE

FORE 404	Special Topic – Forest Biosecurity (2012 only)
FORE 422	Forest Harvest Planning
FORE 423	Forest Transportation and Road Design
FORE 426	Forest Products Marketing and International Trade
FORE 435	Forest Economics 2
FORE 436	Forest Tree Breeding
FORE 443	Biosecurity Risk Management (not offered in 2012)
FORE 475	Independent Course of Study (not offered in 2012 at time of writing)
FORE 414	Dissertation ( <i>Only available in Year 4 to Honours students by invitation, additional to standard course of study in 4<sup>th</sup> Year</i> )

15 points from another Faculty (one available across Years 3 and 4)

# Bachelor of Engineering (Hons) – Forest Engineering

## 1<sup>ST</sup> PROFESSIONAL YEAR

EMTH 210	Engineering Mathematics
ENCN 213	Design Studio I
ENCN 221	Engineering Materials
ENCN 231	Solid Mechanics
ENCN 253	Soil Mechanics
ENFO 204	Forest Measurement
FORE 205	Introduction to Forest Engineering
FORE 215	Forest Economics

## 2<sup>ND</sup> PROFESSIONAL YEAR

ENCN 305	Computer Programming and Stochastic Modelling
ENCN 353	Geotechnical Engineering
ENCI 371	Project and Infrastructure Management
ENFO 327	Wood Science
ENNR 320	Integrated Catchment Analysis
	<u>Or</u>
ENCI 335	Structural Analyses
FORE 316	Forest Management
FORE 342	Geospatial Technologies in Forestry

## 3<sup>RD</sup> PROFESSIONAL YEAR

ENCI 415	Pavement Engineering
ENFO 411	Forest Engineering Research and Design
ENFO 420	Harvest System Evaluation
FORE 422	Forest Harvest Planning
FORE 423	Forest Transportation and Road Design

plus any set of degree courses which is equivalent to at least 45 points and at 400 level – subject to the approval of the Forest Engineering Committee of the Faculty of Engineering & Forestry (in practical terms, in consultation with Assoc Prof Rien Visser).

## Non-Academic Requirements

Both the BForSc and BE(Hons) degrees have non-academic requirements that students are required to meet before they are eligible to graduate. Information on the requirements for BForSc students can be found on Page 18 of this Handbook and the Forestry Science/Forest Engineering Learn site.

BE(Hons) students are required to complete a period of approved practical work (120 days); submit an approved valid 1<sup>st</sup> Aid Certificate; and complete an approved course of workshop training. Full details on these requirements can be found at

<http://www.engf.canterbury.ac.nz/practical/index.shtml>

For specific information on how to sign for the workshop training (mechanical), go to the following web link:

<http://www.civil.canterbury.ac.nz/ugrad/undergrad.shtml>

read the section entitled “Workshop Training Course”. You will need to continue on with additional links in that section.

1<sup>st</sup> Aid training can be sourced through a number of training providers, at varying costs. Students should schedule training in their own time. Some training providers within the Christchurch metropolitan area, with current rates at the time of writing, include:

City First Aid, Workplace First Aid course, \$132.25  
[www.cityfirstaid.co.nz](http://www.cityfirstaid.co.nz)

Life Care Consultants, Workbased First Aid Training, \$207.00  
[www.cpr.co.nz](http://www.cpr.co.nz)

St John, First Aid Level 2 course, \$235.00,  
[www.stjohn.org.nz/education](http://www.stjohn.org.nz/education)

Red Cross, Comprehensive First Aid course, \$180.00  
[www.redcross.org.nz](http://www.redcross.org.nz)

It is YOUR responsibility to ensure that you have completed all the requirements before the due dates in any calendar year.

Assessment details for all FORE and ENFO courses will be handed out in class on the first day of each course. A new centralised timetable system will operate from 2012 – personal timetables will be available on your student web page. Room allocations will be available by looking up course descriptions on the Course Information System 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 courses with a minimum weighting of 120 points. At least 90 points shall be from the 300 and 400-level Forestry schedule. 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 eundum* 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

### 1st Semester

FORE 604	Advanced Forest Tree Breeding
FORE 607	Forest Harvesting
FORE 610	Research Methods
FORE 613	Marketing
FORE 616	Restoration Ecology
FORE 624	Plantation Silviculture
FORE 642	Advanced IT Applications in Forestry and Natural Resource Management
FORE 643	Modelling for Forest Management (web-based course)

### 2nd Semester

FORE 606	Forest Transport
FORE 610	Research Methods
FORE 612	Advanced Forest Economics
FORE 641	Plantation Forest Management
FORE 665	Pest Management and Biological Security

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

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

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 Coordinator 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.

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.

Percentage	Grade	Grade Point	Percentage	Grade	Grade Point
≥ 90%	A+	9	60-64%	C+	3
85-89%	A	8	55-59%	C	2
80-84%	A-	7	50-54%	C-	1
75-79%	B+	6	40-49%	D	0
70-74%	B	5	<40	E	-1
65-69%	B-	4			

## Pass Exam as a Whole and Failed Courses

Degree regulations have changed and there is no longer a mechanism for Pass Exam as a Whole in any College of Engineering programme – including Bachelor of Forestry Science and BE(Hons)Forest Engineering. Students who fail a paper will be required to repeat it.

Where a student fails the same paper twice he or she must apply in writing to the Dean of Engineering and Forestry for permission to undertake that paper a third time. Where a student fails that paper for a third time, they may be excluded from the BForSc programme (on the recommendation of the Dean of Engineering and Forestry).

## 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 course of study. 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 and can find a suitable supervisor for their work.

The grade point average required for invitation to Honours is B. The calculation of honours grade point averages are under review and will be notified to students during 1<sup>st</sup> Semester 2012.

## **Graduate Diploma in Forestry**

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

## **Postgraduate Diploma in Forestry**

The 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.

## **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/postgrad>

## **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 Forestry 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).

Up-to-date information on scholarships and prizes (including application deadlines) can be found on the University Scholarships website. This is updated regularly and students are encouraged to check the site. The web address is:

<http://www.canterbury.ac.nz/scholarships>

# 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 when 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 (in practical terms, with the School Coordinator). You must also register with the Disability Resource office which can be found on Level 3 of the Rutherford Building (Room 317).

## 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.lps.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 organisation(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 and late enrolment fees.**

## School of Forestry Computer Room Rules

The Computer Room facilities are provided for you to 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.

## **Mentoring Programmes**

Trained mentors are available to help students adjust to university life. Mentors are experienced students studying a variety of courses. Your mentor will work with you to help you find your way around the campus, give you lots of survival tips, answer questions about the university and its systems, advise you where to go or who to see, introduce you to other students, and make the place seem less isolating. Your mentor is a friendly face, someone to share worries and concerns with and to provide you with encouragement and support.

For further information go to [www.canterbury.ac.nz/sas/mentoring](http://www.canterbury.ac.nz/sas/mentoring) (includes a link to register for a mentor) or email [mentoring@canterbury.ac.nz](mailto:mentoring@canterbury.ac.nz).

## **Code of Student Conduct**

All students agree to comply with the regulations and policies of the University of Canterbury when they accept their Offer of a Place each year at enrolment. These regulations and policies are located in various publications including the UC Calendar, the Policy Library and via paper/online enrolment. Additionally, the School has regulations and codes of practice that students and staff are expected to adhere to. It is our responsibility to ensure that you have access to such information. The School's regulations and codes are made public via this Handbook and through Induction Sessions and other means (such as Health & Safety forms preceding field trips).

The University of Canterbury's Code of Conduct explicitly restates that the law of New Zealand applies to all members of the UC community and all who visit its facilities. Other regulations and codes can be found under two areas:

- The University of Canterbury Calendar <http://www.canterbury.ac.nz/publications/calendar.shtml> and include, but is not limited to: discipline regulations; parking and traffic statutes; and general course and examination regulations
- University Policies <http://www.canterbury.ac.nz/ucpolicy/index.aspx> and include, but is not limited to: assessment; computer use; drug and alcohol; University field activities; building access; harassment and complaints procedures; and smoke-free policies.

## 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 (see below)	2-3 April 4 April
<b>FORE 218</b>	Hari Hari	14-20 April
<b>FORE 219</b>	Reefton	30-31 August
<b>FORE 307</b>	Silviculture Trip	2-5 April
<b>4<sup>th</sup> Year</b>	Case Study	16-21 April (to be confirmed at start of FORE 419)

### Indicative Costs:

1 <sup>st</sup> Year (Hanmer Springs only)	\$100 incl GST
2 <sup>nd</sup> Year	\$398 incl GST
3 <sup>rd</sup> Year	\$261 incl GST
4 <sup>th</sup> Year	\$192 incl GST
General Requirements Training	\$42 + GST

The School heavily subsidises transportation costs across all field trips. Please note that the cost of getting to the 4<sup>th</sup> Year field trip is met by students, the subsidised costs of transportation during the field trip are met by the School.

**You will be invoiced in advance for the course/year field trips (charges will be included on your enrolment invoice at the beginning of the year). The General Forestry Unit training will be invoiced on completion of the course. If you already have a current 1<sup>st</sup> Aid certificate or General Forestry Unit standards (17769), please present the appropriate original certificates or original of your NZQA Record of Learning to the School Administrator.**

**You are required to present a certificate for 1<sup>st</sup> Aid Unit standards 6400, 6401 and 6402 at some stage over the period of your degree. Completion of this training is your responsibility.**

You can access 1<sup>st</sup> Aid training through a number of training providers (see Page 8 for information and indicative costs). It is YOUR RESPONSIBILITY to attend the course and present a certificate to the School Administrator at some stage prior to the October of your final year of study.

## Personal Safety Equipment

All students enrolled in the BForSc and BE(Hons) (Forest Engineering) programmes are required to have their own hard hat, safety boots, hiking shoes and wet weather clothing throughout the duration of their degree. The School has hard hats for sale at the main office.

## Vacation Employment

Students are required to complete at least 90 days of work experience. To ensure that University learning is applied in the workplace, this work experience is to be carried out after commencement of study at the School of Forestry. It should consist of:

- A section of 30 days of manually oriented work experience (virtually any field employment in *an area related to degree studies*; for example forestry operations; forest or conservation inventory; wood processing; other manual work in the forestry sector. Lab work may qualify if it is routine testing or if it involves gathering information in the field ('getting your hands dirty'). Ensure work is relevant to the degree – if in doubt please check with the School Administrator);
- A section of 30 days of professionally oriented work experience (the focus is on applying university education in a practical situation. Typical examples are: positions involving research & development, investigation, feasibility studies; forest planning and/or valuation; economic study; inventory analysis; laboratory work (other than routine testing); work study; production planning and control; or any well defined task with a significant forestry content.)
- The remaining 30 days may be made up of either manual or professional work experience.

Students must submit two written reports. They should relate to two different types of practical work of at least 30 days each, one normally being of 'manual' experience, and one of professional practice. It is preferable the reports also relate to two different employers. If both periods of work are with the same employer, the reports must be substantially different, *i.e.* on two different departments or types of work experience (as above). Students are not permitted to submit a single report to be credited as two reports.

The reports must be submitted to the School of Forestry Office by the first Monday in March following the long vacation in which the work was performed. The two reports will be reviewed and given a pass/fail grade. Both reports must be passed for the practical work to be credited towards the degree.

You will not graduate without meeting the 90-day requirement. Students should obtain written confirmation (signed and on Company letterhead) from their employers of the period of employment and the type of work undertaken.

Guidance on the requirements and structure of the reports can be obtained from the School Administrator.

Students who commenced the BForSc prior to 2011 will meet the practical work requirements that were in place at the time of their first enrolment.

# Course Outlines

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

**Content:** First semester, 3 hours lectures/week; 1 x 2 hour lab/week (labs are run in weeks 2-7 only)

**Coordinator:** Dr Luis Apiolaza

**Objectives:** To introduce students to the dynamic relationship between forests, environment and society; to examine the nature, location and significance of the world's forests and their relationship to the environment; to introduce the student to the historical and current societal attitudes to forest use; to provide an overview of goods and services provided by forests; to identify key tree species.

**Syllabus:** Uniformity; classification; history; deforestation; environmental benefits; non-wood forest products; urban forestry; community forestry; agroforestry; forest products; plantations; forest industry in New Zealand; forests and climate change; wood production, processing and variability; international forestry case studies; New Zealand's indigenous forests; sustainable forest management.

**Final Exam:** Date to be advised

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

**Content:** Second semester (**5 Weeks**), 3 x 2 hour lectures per week; plus 2 full day (Saturday) field trips at the end of weeks 2 and 3.

**Lecturer:** Mr Nick Ledgard and others

**Objectives:** To introduce students to the way in which trees are utilised in situations other than large-scale industrial forestry. Emphasis is given to mixed species, environmental legislation and certification, and issues associated with the growth and management of single tree and small woodlot species.

**Syllabus:** Calibration, trees and people; attitudes to trees; planning and NZ environmental considerations; introduction to plantation silviculture; NZ Farm Forestry Association; introduction to tree establishment; introduction to woodlot/plantation management; native plants in rural/urban settings; managing animals with trees; water/soil impacts; erosion control/riparian management; joint ventures; landscaping, tree spread, pest issues; urban forestry/arboriculture.

**Final Exam** No final exam

## **FORE 141/ ENFO 204**

## **FOREST GROWTH AND MEASUREMENTS**

- Content:** Second semester, 3 x 1 hour lectures/week; 6 hours labs/field trips/week (note labs/field trips are broken down to two sessions)
- Lecturers:** Assoc Prof Bruce Manley and others
- Objectives:** To introduce students to the way in which trees and forests are measured. Emphasis is given to techniques and technologies associated with single tree and stand measurement.
- Syllabus:** Tree measurement; stand variables; growth and yield modelling; sampling; forest inventory; log measurement; surveying and area measurement; mapping and aerial photography; introduction to global positioning systems (GPS) and geographic information systems (GIS).
- Final Exam:** Date to be advised

## **FORE 151**

## **COMMERCIAL ASPECTS OF FORESTRY**

- Content:** First semester, 3 x 1 hour lectures/week; 1 x 2 hour lab/week
- Lecturer:** Dr David Evison
- Objectives:** This course provides an overview of the tools of analysis of commercial aspects of the forestry sector. It describes the main commercial disciplines, and shows how they are applied in the commercial forestry environment. The course provides a background in micro-economic theory within a forestry context.
- Syllabus:** Evaluation forestry sector performance at the business and industry level; an introduction to the key commercial disciplines as they are applied to forestry; understanding methods to assess the value of forests in providing timber and non-timber benefits; identifying the strategic choices and issues facing the commercial forestry sector.
- Required Text:** Lattimore, Ralph G. The New Zealand Economy: an introduction (2011). (Available from the University Bookshop)
- Final Exam:** Date to be advised

## **FORE 205                    INTRODUCTION TO FOREST ENGINEERING**

**Content:** First semester, 3 x 1 hour lectures/week; 1 x 4 hour lab/week

**Lecturer:** Assoc Prof Rien Visser

**Objectives:** Students will understand the importance of timber harvesting, including historical developments; be able to describe the key steps in the harvesting process, including alternatives for each step; know the key factors and variables needed to develop a basic harvest plan; and understand the importance of both safety and protection of the environment in forest operations.

**Syllabus:** History of logging and reasons for harvesting; steps in the harvesting process; common equipment use in forest operations; machine capabilities and limitations; developing harvesting systems, including ground-based, cable and helicopter; introduction to harvest planning and forest roads; machine costing and system productivity; environmental and safety aspects of forestry operations; the Resource Management Act and the Occupational Safety and Health Act; forest hydrology, with a focus on minimizing impacts of operations on water quality.

**Final Exam:** Date to be advised

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

**Content:** Second semester, 3 x 1 hour lectures/week; 1 x 2 hour lab/week

**Lecturer:** Dr David Evison

**Objectives:** Students will understand and be able to discuss the basis for forestry as a business; understand and be able to discuss production, consumption and trade in forestry products both in New Zealand and internationally; be able to practically apply their knowledge in the area of analysis of commercial forest investment; be able to describe and discuss the issue of sustainability in a production forestry context; and be able to demonstrate understanding of how to quantify non-timber values in commercial forests.

**Syllabus:** The course will cover economic theory and practical applications in three main areas:

- Forestry as a business – analysis of commercial forest investments.
- Production, consumption and trade in forestry products, New Zealand and global.
- Non-timber values of commercial forests.

**Final Exam:** Date to be advised

## **FORE 218      FOREST BIOLOGY**

**Content:** First semester 4 x 1 hour lectures/week; 1 x 3 hour lab/week

**Lecturers:** Assoc Prof David Norton plus others to be appointed

**Objectives:** Students will understand basic systematics and evolution of conifers and angiosperms; be able to describe and explain key ecophysiological factors affecting trees; be able to describe and explain environmental gradients that drive vegetation distributions; be able to discuss the role of disturbance in maintaining vegetation patterns; be able to describe key governmental and private structures involved in forest health and biosecurity; be able to describe and discuss the role of pathogens and insect pests in forests; be able to identify key vertebrate pests and discuss the impacts that they have in production and indigenous forest systems; and be able to describe the impact and mitigation of abiotic forest health factors in forest systems.

**Syllabus:** Systematic botany of forest trees and biology of New Zealand indigenous forest species; principles of ecology with an emphasis on population, community and ecosystem factors affecting New Zealand's forests; science and management of forest pests, disease, wind, fire, biosecurity and risk.

**Final Exam:** Date to be advised

## **FORE 219      INTRODUCTION TO SILVICULTURE**

**Content:** Second semester, 3 x 1 hour lectures/week; 1 x 2 hour lab/week

**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 201)

### Content:

First semester, 3 x 1 hour lectures/week; 1 x 1 hour lab/week  
(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: to be advised by Maths & Stats Department

### Objectives:

To provide a practical introduction to some of the most common statistical techniques. Students will be able to understand a problem involving data and be able to select the correct statistical technique to use to solve the problem; involve problem solving and analysis with emphasis on application to real data; use appropriate software to analyse data so that a problem can be solved; interpret the analysis and results in a way that is easily understood by non-statisticians. Introduce the computer package SAS.

### Syllabus:

Review of basis statistics, sampling distributions, confidence intervals and central limit theorem; hypothesis testing; power analysis and sample size; sampling methods; analysis of variance; multiple comparison methods; two-way analysis of variance; analysis of covariance; experimental design.

### Final Exam:

Date to be advised

## FORE 224

## BIOMETRY IB (double-coded with STAT 202)

### Content:

Second semester, 3 x 1 hour lectures/week; 1 x 1 hour lab/week  
(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:

Assoc Prof Euan Mason, Dr Luis Apiolaza

### Objectives:

Students will be able to understand a problem involving data and be able to select an appropriate regression technique to use to solve the problem; be able to use appropriate software to implement the regression models for analysing the data so that a problem can be solved; interpret the analysis and results in a way that is easily understood by non-statisticians; be able to identify possible flaws in analysis and comprehend their effects and how they may affect the inferences made; be able to identify alternative more appropriate and/or more advanced techniques where required.

### Syllabus:

Review of basis statistics, sampling distributions and confidence intervals; hypothesis testing and analysis of variance; simple linear regression; multiple linear regression; model properties and performance assessment; regression with categorical variables; model comparison; models building and selection; extensions of linear regression models

### 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/stat201>

<http://www.math.canterbury.ac.nz/stat202>

## SOIL 203

## SOIL FERTILITY

**Content:** Second semester, 3 x 1 hour lectures/week; 1 x 3 hour lab/week

**Lecturer:** Dr Mark Bloomberg

**Objectives:** Students will understand and be able to discuss differing soil properties; understand and be able to discuss sustainable land use and its role in environmental protection; and be able to practically apply their knowledge of soil nutrients in the context of plant growth.

**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 307

## PLANTATION SILVICULTURE

**Content:** First semester, 2 x 2 hour, 1 x 1 hour lectures/week; 1 x 6 hour lab/field trip/week

**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.

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, 4 x 1 hour lectures; 1 x 1 hour tutorial/week; 3 x 2 hour labs/week

**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.

**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. 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, 2 x 2 hour, 1 x 1 hour lectures/week; 1 x 1 hour tutorial/week; 1 x 3 hour lab/week (9 weeks)

**Lecturer:** Dr Clemens Altaner

**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 342 GEOSPATIAL TECHNOLOGIES IN FORESTRY**

**Content:** First semester, 2 x 1 hour lectures/week, 1 x 3 hour lab/week

**Lecturers:** Dr Justin Morgenroth

**Objectives:** Students will be introduced to the application of information technology in forestry. Particular attention will be paid to geographic information systems, global positioning systems, and aerial photography. Labs will provide students with practical skills related to the use of data collection technologies and analysis with geographic information systems.

**Syllabus:** Innovation in Forest Management; Data sources and management; Spatial Data Acquisition – GPS; Attribute Data Acquisition - Remote Sensing; ground truthing; aerial photo interpretation; understanding maps, data models in GIS, analysis in GIS, visualisation in GIS, issues with GIS, integrating and assessing new technologies.

**Final Exam:** No Final Exam

## **FORE 414            DISSERTATION**

**Content:**            Whole Year, irregular seminar sessions to be advised at commencement of academic year

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. There will be a series of seminars students are required to attend. Advance notice will be provided

**Coordinator:**        Dr David Evison

**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:**            Whole year, 3 x 1 hour lectures/week (1<sup>st</sup> Semester); some ad hoc scheduled sessions in 2<sup>nd</sup> Semester

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, 3 x 1 hour lectures/week; 1 x 4 hour lab/week

**Lecturer:**

Mr Simon Fairbrother

**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:**

Harvest planning and analysis of harvesting systems. Machine capability and requirements. Impacts of terrain and stand variables on harvest systems. Ground-based planning including SKIDPC. Advanced cable yarding planning with CYANZ. Landing design and layout. Contract supervision and workforce management. Production planning and control systems.

**Final Exam:**

Date to be advised

## **FORE 423**

## **FOREST TRANSPORTATION AND ROAD DESIGN**

**Content:**

Second semester, 1 x 2 hour, 1 x 1 hour lectures/week; 1 x 4 hour lab/week

**Lecturer:**

Mr Simon Fairbrother

**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:** Evaluation and comparison of options for the transport of forest products. Review of soil engineering characteristics and low-cost methods to determine the bearing capacity of subgrade soils. Vehicle/road interaction. Legal regulations for heavy vehicles operating on New Zealand public roads. Forestry truck and trailer designs and their impact on load capacity and vehicle safety. Road design for forest roads and the design of low-cost water crossings and drainage structures. Application of RoadEng road design software. Cost estimation and contract management for road construction.

**Final Exam:** Date to be advised

## **FORE 426                    MARKETING AND INTERNATIONAL TRADE IN FOREST PRODUCTS**

**Contact:** First semester, 2 x 2 hour lectures/week; 1 x 2 hour lab/week

**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.

**Final Exam:** Date to be advised

## **FORE 435 FOREST ECONOMICS 2**

**Content:** Second semester, 2 x 1 hour lectures/week; 1 x 2 hour lab/week

**Lecturer:** Dr David Evison

**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

**Final Exam:** Date to be advised

## **FORE 436 FOREST TREE BREEDING**

**Content:** First semester, 2 x 1 hour lectures/week

**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 443 BIOSECURITY RISK MANAGEMENT**

**Content:** Second semester, 3 x 1 hour lectures/week. NOT OFFERED IN 2012

**Lecturer:** To be appointed

**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

Students are able to enrol in FORE404: Special Topic Forest Biosecurity for 2012. Lectures are co-taught with BIOS201. Additional details, lectures and assessment will be arranged before the start of the course.

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

**Content:** Second semester, 3 x 1 hour lectures/week/ 1 x 4 hour lab/week **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, 3 x 1 hour lectures/week/ 1 x 4 hour lab/week **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:** Date to be advised

## **ENFO 411**

## **FOREST ENGINEERING RESEARCH & DESIGN**

<b>Content:</b>	Second semester, 1 x 2 hour lecture/week
<b>Coordinator:</b>	Assoc Prof Rien Visser
<b>Objectives:</b>	To be able to set up, manage and carry out a specific research project and to understand the process and importance of research in Forest Engineering
<b>Syllabus:</b>	Research methods and research project focussed on the application of engineering principles to the solution of a forest engineering design problem. Project management principles will be taught. The project will contain literature review, research design, data collection, analyses and design and build phases. Topics to be established in class with industry and student input.
<b>Final Exam:</b>	No final exam

## **ENFO 420**

## **HARVEST SYSTEM EVALUATION**

<b>Content:</b>	First semester, 1 x 2 hour lecture/week, 1 x 4 hour lab/week
<b>Lecturer:</b>	Assoc Prof Rien Visser
<b>Objectives:</b>	Learn techniques for analysing and evaluating complex systems, with a focus on forest operations.
<b>Syllabus:</b>	Forestry equipment fundamentals and design. Harvest system design and costing. Time-and-motion studies. Developing productivity models. Methodologies for setting logging rates. Ergonomics and safety management. Bio-energy harvesting systems and bio-fuels.
<b>Final Exam:</b>	Date to be advised

**Extra lecture hours/tutorials will be arranged once enrolments are known via agreement with your course lecturer.**

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

**Content:** First Semester, 2 x 1 hour lectures/week

**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, 1 x 2 hour, 1 x 1 hour lectures/week; 1 x 4 hour lab/week

**Lecturer:** Simon Fairbrother

**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, 3 x 1 hour lectures/week; 1 x 4 hour lab/week

**Lecturer:** Simon Fairbrother

**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 610 RESEARCH METHODS**

**Content:** First and Second Semesters  
On-line course via LEARN, with additional seminars notified as required.

**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:** Second semester, 2 x 1 hour lectures/week; 1 x 2 hour lab/week

**Lecturer:** Dr David Evison

**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 MARKETING**

**Content:** First semester, 2 x 2 hour lectures/week; 1 x 2 hour lab/week

**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.

- 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 616 RESTORATION ECOLOGY**

**Content:** First semester. 1 x 2 hour lecture/week

**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, 2 x 2 hour, 3 x 1 hour lectures/week; 1 x 6 hour lab/field trip/week

**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 64 I                    PLANTATION FOREST MANAGEMENT**

**Content:** Second semester, 4 x 1 hour lectures/week; 1 x 1 hour tutorial/week; 3 x 2 hour labs/week

**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 AND NATURAL RESOURCE MANAGEMENT**

**Content:** First semester, 2 x 1 hour lectures/week, 1 x 3 hour lab/week

**Coordinator:** Dr Justin Morgenroth

**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 FOREST 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 AND BIOLOGICAL SECURITY**

- Content:** Second semester, 3 x 1 hour lectures/week
- Lecturers:** To be appointed
- 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 David Evison or Euan Mason.**

### 1<sup>ST</sup> YEAR BFORSc S1

	<b>Mon</b>	<b>Tue</b>	<b>Wed</b>	<b>Thu</b>	<b>Fri</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>					

### S2

	<b>Mon</b>	<b>Tue</b>	<b>Wed</b>	<b>Thu</b>	<b>Fri</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>					
<b>6-8</b>					

## 2<sup>ND</sup> YEAR BFORSc SI

	<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>					
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## S2

	<b>Mon</b>	<b>Tue</b>	<b>Wed</b>	<b>Thu</b>	<b>Fri</b>
<b>8-9</b>					
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<b>3-4</b>					
<b>4-5</b>					

### 3<sup>RD</sup> YEAR BFORSc SI

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

### S2 2011

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

### 4<sup>TH</sup> YEAR BFORSc S1

	<b>Mon</b>	<b>Tue</b>	<b>Wed</b>	<b>Thu</b>	<b>Fri</b>
<b>9-10</b>					
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### S2

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<b>4-5</b>					



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