University of Toronto TORONTO ONTARIO M5S 1A1

OFFICE OF THE VICE-PRESIDENT (POLICY DEVELOPMENT) AND ASSOCIATE PROVOST

TO: Members of the Committee on Academic Policy and Programs

SPONSOR: Carolyn Tuohy
CONTACT INFO: 978-2181; c.tuohy@utoronto.ca

DATE: February 26, 2003 for meeting of March 5, 2003

AGENDA ITEM: Item 4

ITEM IDENTIFICATION:
School of Graduate Studies: Proposal for a new Master of International Trade in Forest Products (M.T.F.P.) program

JURISDICTIONAL INFORMATION:
The Committee has authority for approval of major program and curriculum changes

HIGHLIGHTS:
The proposed program is a professionally-focused masters program, to be offered in an executive format comprising six week-long intensive residential modules over a 16 month period. It is directed at people in mid-career seeking to advance in careers involving a high level of capability in analysis and negotiation regarding trade in forest products. It is consistent with the Faculty's focus on graduate education in targeted areas which draw upon the particular strengths of the University of Toronto, and will involve participation by faculty from the Rotman School of Management, the Institute of Policy Analysis and the Faculty of Law.

RECOMMENDATION:
It is recommended that the Committee on Academic Policy and Programs recommend to the Academic Board for approval:

The new Master of International Trade in Forest Products (M.T.F.P.) program as described in the submission from the School of Graduate Studies, dated February 10, 2003, effective January 2004.

25480

February 10, 2003

Professor Carolyn Tuohy
Vice-President, Policy Development
and Associate Provost
Room 206, Simcoe Hall
27 King's College Circle
University of Toronto

Dear Professor Tuohy:

At its meeting of January 28, 2003, the Council of the School of Graduate Studies approved the following motion:

> **THAT** SGS Council approve the proposal of the Faculty of Forestry for a new graduate program leading to a Master of International Trade in Forest Products (M.T.F.P.) degree, effective January, 2004.

The motion, proposal and executive summary are attached. The proposal was approved at the January 14, 2003, meeting of the Division IV Executive Committee.

On behalf of the Council of the School of Graduate Studies, I am presenting this item to Governing Council committees, as appropriate, for approval.

Yours sincerely,

Jane Alderdice
Secretary to SGS Council
and Coordinator of Policy, Program and Liaison

Encl.
/smr

c.c. R. Bryan, U. deBoni., T. Chan, P. Cooper, S. Girard, C. Johnston, L. Yee

H:Council/FollowUp/2002-2003/Jan 28/MTFP

Motion

School of Graduate Studies Council
Tuesday, January 28, 2003

Item 6.

MOTION (/) **THAT** SGS Council approve the proposal of the Faculty of Forestry for a new graduate program leading to a Master of International Trade in Forest Products (M.T.F.P.) degree, effective January, 2004.

See the proposal and executive summary attached.

NOTE:
The Division IV Executive Committee at its meeting of January 14, 2003 approved this proposal.

With SGS Council's approval this item will go to Governing Council committees for approval, and to the Ontario Council on Graduate Studies for a standard appraisal.

Master of International Trade in Forest Products

Executive Summary

This proposal is to introduce a unique new program which addresses a critical forest sector need in Canada, and also to cater to a potentially important international demand. Amongst major forested nations, Canada is uniquely dependant on the export of forest products. Although the proportional contribution to the GDP has declined significantly, forest product exports still contribute some $40 billion annually to the external balance of trade. Canada is unusually vulnerable to any trade obstacles and has a strong interest in promoting equitable trade relations which are based on, and promote, sustainable forest management.

The M.T.F.P program is intended to produce a small cadre of very well-trained specialists who can contribute a high level of analytical capability to analysis of and negotiations surrounding forest product trade. There is a small but significant demand for such specialists in large forest product industries, trade organizations, governments concerned with forest products or policy development, and, increasingly, in international institutions and environmental organizations. The program will complete the suite of three "professionally-focused" programs centrally approved in the previous and present Faculty strategic plans.

Applicants may appropriately come from a wide range of academic backgrounds, but must meet the same admission standards as other Faculty programs. However, the program is targeted primarily at people who have substantial relevant professional experience, and who are likely to currently hold high level positions in government or industry. To facilitate such students, the program will be offered in six intensive week-long residential modules over a sixteen month period, culminating in public presentation of a major research paper in the Faculty of Forestry. Each module has been proposed to S.G.S. as a new course to be introduced in the 2003-2004 calendar (FOR3020, 3021, 3022, 3023, 3024, 3025, 3026). The target start date for the program is January, 2004.

The program will be coordinated and administered by Professor Laaksonen-Craig in the Faculty of Forestry. The major part of program instruction will be carried out by members of the Faculty, with additional support from the Rotman School of Management, the Institute of Policy Analysis and the Faculty of Law (letters of support are provided) and one member of the Faculty of Commerce at UBC. This core instructional group (Laaksonen-Craig, Kant, Balsillie, Martell, Pauley, Trefler, Brean, Matthewson, Trebilcock and Vertinsky) will also be supported by an international expert advisory panel, who will also take part in practical seminars and case study analyses.

It is expected that initially most students will come from Canada, but the focus of the program and course instruction is international and significant international recruitment is expected after some years. The program is designed to be largely or completely supported by fee revenue. The initial target enrollment is from 5 to 10 students, and with the present structure and instructional resources, an enrollment cap of 12 students is necessary. The program is designed on the model of an executive M.B.A. where costs are covered by student fees. Modest revenue generation is anticipated, shown in a detailed budget, which has been discussed with the Vice Provost, Planning and Budget.

UNIVERSITY OF TORONTO

Brief for the Assessment of a Proposal for a new Master of International Trade in Forest Products Program in the Faculty of Forestry

Submitted to the
Ontario Council on Graduate Studies
November, 2002

SECTION I: THE PROGRAM

CONTENTS

1 INTRODUCTION

1.1 Brief Listing of Programs

The Faculty of Forestry currently offers three graduate programs leading to the degrees of Master of Science in Forestry (M.Sc.F.), Master of Forest Conservation (M.F.C.) and Ph.D. The M.Sc.F. has been offered since 1920, the Ph.D. since 1972 and the M.F.C. since 1996. The Faculty and the programs offered were most recently appraised by O.C.G.S in 1999 and were reported to be of good standard without concerns. The present proposal is to add a new degree program, Master of International Trade in Forest Products (M.T.F.P) to the existing programs. As this program is entirely new in concept, without precise parallel in other universities in Canada or elsewhere, a brief background rationale is presented below.

Forest products have been important in international trade for at least two centuries, but the number of countries involved has expanded significantly in recent decades. Trading relationships have become increasingly complex. The trade is still overwhelmingly dominated by four regions - Russia, the United States, Scandinavia and Canada, but southern countries such as New Zealand and Chile have emerged as major producers. Canada, with some 10% of global forest resources, is one of the largest global producers of pulp, paper and lumber, and the largest exporter of lumber, pulp, paper and paperboard. Canada's dependence on forest product exports is exceptional, with over 12% of export income derived from forest products. The increasing complexity of the international forest products trade, and the influence of such factors as free trade associations, international regulatory and financial institutions, and international legal and environmental conventions, are of immense importance to Canada. As a dominant producer, Canada can, and should, provide leadership in promoting free and equitable trade relationships which are based on, and promote, environmentally sustainable forest management practices.

Canada's dominance in the forest products trade started in the early 1800s, in response to timber shortages in Europe. Trade expanded rapidly in the nineteenth century, supplied primarily from forests in the Atlantic Provinces, Quebec and Ontario. Eventually, in the last decades of the century, the European market waned with the progressive decline of wooden shipbuilding. The United States emerged as the main export market, currently receiving some 77% of total Canadian wood product exports. Since World War II, British Columbia has emerged as the largest exporting province, to the U.S. and Southeast Asia, but forest product industries are now significant in most provinces. Exports of forest products are valued at $44 billion per year, and contribute $38 billion to the national balance of trade, and $21 billion to the GDP. Across the country some 370,000 jobs ($11.8 billion in wages and salaries) and 300 communities are directly, and, in many cases, solely dependent on forest product industries, while nearly 800,000 jobs are indirectly dependent. As a result both the national economy and a significant portion of Canadian society are strongly influenced by international trade in forest products, and extremely vulnerable to any obstacles which impede this trade or reduce its profitability.

The forest product trade and debate about relevant policies in Canada have been overwhelmingly dominated by relationships with the United States. Export of Canadian lumber to the United States has been a major source of contention since the mid nineteenth century, and the current dispute triggered by the termination of the Softwood Lumber Agreement in spring, 2001, is merely the most recent of many actions which have repeatedly disrupted and obstructed trade relations. Although the dispute with the United States is of immense current importance, it is a bilateral issue. With development of international institutions such as the United Nations Organization, and the globalization of economies in recent decades, international trade in forest products is increasingly influenced by a much wider range of multilateral factors. These include the development of international financial institutions, international

currency markets and exchange rates, the emergence of major free trade areas and associations, such as the European Union, and by global trade initiatives such as the World Trade Organization. International trade in forest products is also increasingly influenced by environmental concerns, focused by the United Nations Conference on the Environment and Development (UNCED) in Rio de Janeiro in 1992. U.N.C.E.D. stimulated international debate on the dwindling forest resources and the sustainability of forest management methods, which has been renewed and reinforced at the recent UN Earth Summit on Sustainable Development at Johannesburg. It also led to identification of appropriate criteria and indicators for sustainably managed forests, and certification systems to identify forest products from such forests. Environmental concerns have emerged as central issues in international trade, both as potential non-tariff trade barriers, but also as objectives for responsible global stewardship. Aboriginal land claims and the cultural rights of indigenous peoples, including ownership of genetic resources, are also increasingly important issues which affect international trade.

The issues outlined have created an extremely complex decision-making environment for governments involved in forest policy administration and for those forest product industries which trade internationally. Comprehensive understanding of factors affecting trade and the capacity to predict future trends are essential for both industrial planning and government policy development. There will be an increasing need for relevant analytical expertise in government departments at all levels engaged in forest policy development, and with the economic and social impact of such policies. In Canada, forest policy will be increasingly affected and constrained by international treaties and representatives of Canadian governments will be required to interact with international institutions, foreign government bodies and non-governmental organizations in establishing international forest policies. This need is reflected by the appointment of a Standing Committee of the House of Commons on Forest Management Practices in Canada as an International Trade Issue which reported in June, 2000. Similar expertise is essential for forest products industries and for major financial institutions associated, to guide tactical and strategic management and investment decisions. The Faculty of Forestry has developed the new M.F.T.P. program to meet these demands, to stimulate improved international trade relations and to promote environmentally responsible stewardship of forested lands.

1.2 Objectives of the Program

The objective of the program is to produce highly-qualified and competent graduates who combine knowledge of the forest products industry with comprehensive understanding of the economic, financial, political and legal factors which impact on forest policies and international trade. It is not the intention of the Faculty to attempt to replace expertise drawn from cognate disciplines, but to produce graduates who are literate and articulate in both theory and methodology of each of these disciplines and who can provide effective leadership in multidisciplinary teams. The program will be housed in and administered by the Faculty of Forestry, which will also provide the majority of the core instructors. However, in order to ensure the highest level of instruction in each of the most relevant disciplines, a cross disciplinary team of instructors has been assembled from the Rotman School of Management, the Faculty of Law and the Institute of Policy Analysis (Department of Economics), as well as one faculty member from the Faculty of Commerce, University of British Columbia, who is an Adjunct Professor in the Faculty of Forestry.

In addition to the academic objectives of the program, identified above, a key program objective is that each graduate will be fully conversant with the practical and political constraints which frequently impede free and equitable trade relations. A critical component in meeting this objective is the active involvement of senior personnel with experience in the forest products industry, and in international trade relationships of provincial and federal governments. An international body of advisors has been

assembled who will add their expertise to the program through lectures, seminars and participation in case study analyses. They will also act as supplementary advisors to students throughout the program. Membership of this international panel will be for an initial period of three years, and may be renewed by mutual consent.

Program objectives will be achieved through lectures, seminars, case study analyses and debates, organized in six intensive residential modules over a period of sixteen months. These modules, each of which constitutes a graduate course, are shown in Section 4.4. Each module will be team taught by 2-3 members of the core faculty group, with the participation of at least one, and more commonly, two of the international advisory board. Reading material will be assigned prior to each module, and research assignments will be carried out by students during the intervals between modules. During the intervals between modules frequent internet contact will be maintained between students and faculty and between students. In addition to intermodule projects, each student will also complete one major research paper, which will be formally presented in the Faculty of Forestry as the terminal requirement of the program.

The modular structure of the program has been chosen in part to facilitate the involvement of members of the international advisory panel, but also because of the nature of the student body which we expect to attract to the program. The object of the program is not only to produce graduates with a high level of expertise, but also to ensure that this expertise is used effectively. The program is therefore primarily targeted at (though not exclusively restricted to) those who either hold, or can reasonably expect to hold in the near future, positions of sufficient authority to make this a realistic objective. These would include government positions at director or assistant deputy minister level and private sector positions at vice-presidential level. It follows that the program will be rigorous and highly selective, accepting only students who combine high academic qualifications with significant practical experience related to international trade in forest products. The conceptual model for the program is that of an Executive MBA, and it is expected that the majority of students entering the program will already hold appropriate and relevant positions.

1.3 Method Used for the Self-Study

The program proposal was developed over a period of approximately three years as part of the Strategic Plan for the Faculty of Forestry, 2000-2004, within the University of Toronto Raising Our Sights strategic planning initiative. The original draft proposal was developed by a core group within the Faculty of Forestry, and subsequently considered by the full Faculty before being approved by former Provost Adel Sedra. As part of the agreed Strategic Plan, the Faculty was awarded a tenure-stream faculty appointment, to serve as Academic Coordinator for the program. This position was filled by the appointment, effective July, 2002, of Professor Susanna Laaksonen-Craig.

Following approval of the draft program, a broad step-wise consultation was undertaken, each state culminating in a new, modified version of the proposal. The first stage involved consultation with representatives of the Rotman School of Management, the Institute of Policy Analysis and the Faculty of Law. This was followed by a one-day meeting at the Faculty of a special advisory group consisting of:

- Carl Grenier — Vice President and General Manager, Free Trade Lumber Council, Montreal
- Patricia Mohr — Vice-President, Economics Department, Bank of Nova Scotia, Toronto
- Ola Ullsten — President, World Council on Forests and Sustainable Development (and former Prime Minister of Sweden)
- Katherine McGuire — Director, Trade and International Policy Branch, Ontario Ministry of Economic Development, Trade and Tourism
- John Duncanson — Chief Executive Officer, Duncanson Investments (a forest industry financial advisory company)
- Jim Farrell — Director, International Affairs, Canadian Forest Service, Ministry of Natural Resources
- Robert Carman — Senior Council, GPC Canada (a government policy advisory company), and Chair, Faculty of Forestry Dean's Advisory Board

The proposal was then discussed with Associate Dean Don Cormack and Ms. Jane Alderdice of the School of Graduate Studies. After further modifications, it was considered in detail by the Faculty of Forestry Dean's Advisory Board, which includes representation from the Structural Board of Canada, the Aboriginal Regional Chiefs of Ontario, Tembec Inc., the Ontario Forest Industries Association, World Wildlife, Canada, the Ontario Professional Foresters Association, the Wildlands League, the Canadian International Development Agency and the Ontario Professional Foresters Foundation. Following this consultation, a revised draft of the proposal was widely circulated amongst industries, industry and professional organizations and government agencies across Canada. It was also circulated to all deans of forestry schools in Canada. The present proposal incorporates a wide range of advice derived through this process (copies of advisory letters are provided in Appendix I).

1.4 Fields in the Program

Prior to 1995-96, M.Sc.F. and Ph.D. programs were organized in three broad fields which paralleled the undergraduate professional forestry program which was terminated in 1996: forest management, forest biology and ecology and wood product science. The nature and scope of the discipline of forestry has changed dramatically during the past decade, and it became clear that this tripartite division was no longer an appropriate framework for many important, complex research topics which cross these traditional divisions. This constrained both students' choice of courses, and their ability to engage in innovative research on some of the most important emerging topics in the discipline. Accordingly the identification of separate fields within these thesis-based research programs was abandoned in 1996. While faculty members and graduate students do carry on research in the previous areas of study, all fit well within the broader faculty emphasis on forest conservation. The new program, by contributing to rational and responsible global forest stewardship, also fits within this broad direction.

1.5 Review Concerns

As noted above, no concerns were expressed in the previous O.C.G.S appraisal of Faculty programs in 1999, which reported the Faculty and programs as being of good quality. No fundamental changes have been made in the Faculty since that report, though expansion has taken place in faculty numbers, research funding support and financial support for graduate students, and there have also been significant improvements in computing facilities and equipment. These are identified in subsequent sections.

1.6 Special Matters and Innovative Features

The structure of the program, which is based on that of an Executive M.B.A. program, applied to a completely different discipline, is, to the best of our, knowledge, unique amongst forestry programs. This structure has been chosen for two reasons. Firstly, we believe that structure, based on brief, intensive residential modules, is the only one which will enable participation of the type of students at which the program is primarily targeted. We expect that most students will already hold highly responsible positions in government, industry or non-governmental organizations, and will participate in the program on secondment from their organizations. Secondly, this structure is essential to make participation of members of the international advisory panel in the instructional program possible. We view such participation as vital to the success of the program in meeting its practical objectives.

The potential student body will be highly specialized in focus and in career objectives. The program has been designed with an initial target enrollment of 6 - 10 students per program cycle. Most applicants will probably come from Canada for the initial few program cycles, but the program is of broad international relevance, and it is expected that this will be reflected in enrollment demand within a few years. The program will initially take place at the University of Toronto, based at the Faculty of Forestry. However, it is possible that, in the future, some modules could be organized or paralleled at other locations, particularly using web-based distance learning methods. These possibilities will be explored in the future, but the core of the program will continue to be campus-based at the University of Toronto.

It is expected that graduates from the program will either hold, or will rapidly achieve, influential integrative management and advisory positions. Some will be in federal and provincial government departments involved in the development of economic and trade policy, as well as management of the environment and natural resources. Some will be employed in similar positions in large forest product companies, in large international retail companies such as Home Depot or IKEA, or in industry associations such as the Forest Products Association of Canada or the Ontario Forest Industries Association. Others may expect involvement in organizations such as the Free Trade Lumber Council. Increasingly, however, expertise of this type is also in demand from non-governmental organizations such as World Wildlife Fund, Canada, or the Sierra Club of Canada, and for international forest certification organizations such as the Forest Stewardship Council.

No comparable program exists at other universities in Canada, though most forestry faculties offer some relevant courses, particularly in forest economics and forest policy, directed primarily at accredited professional forestry programs, at the economics of timber extraction and at provincial forest policy. Forestry schools at the University of British Columbia, the University of Alberta and the University of New Brunswick each have programs which address some aspects of the linkage between business and forestry. The University of British Columbia has an International M.B.A., partly taught in China, organized by the Faculty of Commerce, which deals with some aspects of international trade and finance, but does not focus on forest products. The University of Alberta has an M.B.A. offered by the School of Business, which offers specialization in Natural Resources and Energy, and the University of New

Brunswick, Faculty of Forestry also offers a similar linkage between and M.B.A. and forestry. In each case, these programs are strongly focused on business administration and marketing, rather than on the broader trade environment, and issues such as sustainable forest certification. Forest certification is a new disciplinary area of rapidly increasing importance in sustainable forest management and in forest product trade. As far as we can ascertain, the Faculty of Forestry at University of Toronto pioneered the first academic course in this field in 1996, and Yale University has recently (2002) introduced a new master's program in the field. However, this program touches on only one component of the proposed program, and does not address broader trade issues. Two programs at universities in the United States do overlap significantly with program objectives, but not with structure or organization. At the University of Washington, the Centre for International Trade in Forest Products provides a focus for M.Sc. and Ph.D. research programs with streams in Forest Product Marketing and in Forest Economics. Similar research foci are offered at the Warnell School of Forest Resources, University of Georgia and the Faculty of Forestry, Oregon State University, while Virginia Tech offers specialization in Wood Science and Forest Products.

In Europe, as in Canada, forestry faculties at Freiburg University and the University of Gottingen (Germany), the Agricultural University of Vienna (Austria), the University College of Wales, Bangor (United Kingdom) and the Universities of Joensuu and Helsinki (Finland), and the Swedish Agricultural University, Uppsala, all offer instruction in forest economics and forest policy, and provide opportunities for research graduate degrees. The University of Helsinki offers research graduate degrees with concentration in forest economics and forest product marketing.

While the program shares some features with the institutes listed, the level of overlap is significant only with the University of Washington. It differs completely from the latter, however, in its' professional rather than research focus, and in its' organizational structure which is designed for participants who retain high level employment in external organizations rather than for full-time graduate research students. It differs from other programs available in Canada through its' organizational structure as well as its' strong focus on international trade. It also differs from these programs as the structure is designed to make it possible for expert, international practitioners from government and industry to play an important instructional role. The core instructional group is, however, drawn from the University of Toronto, with a strong cross-disciplinary and cross-divisional structure, which combines expertise from the Faculty of Forestry, the Rotman School of Management, the Department of Economics and the Institute for Policy Analysis, and from the Faculty of Law.

2 THE FACULTY

2.1 List of Faculty

The lists of faculty are shown in Tables 2.1.1 and 2.1.2. Table 2.1.1 lists core members of the Faculty of Forestry who are responsible for teaching and supervision in the MSc.F., Ph.D., and M.F.C. (Master of Forest Conservation) programs. In addition to the faculty members listed, the Faculty is currently conducting searches for two Canada Research Chairs. One, at Tier 2 level in Tree Genetics/ Genomics, will be shared equally with the Department of Botany. The second, at Tier 1 level in carbon Sequestration and Forest Management, will be entirely within the Faculty. Both appointments are expected to start in July, 2003. When these positions are filled, the equilibrium faculty complement will be 15.6 full-time equivalents. Faculty from other divisions of the University who have status-only appointments in the Faculty are cross-listed, and participate on M.Sc.F. and Ph.D. supervisory committees, and, in some cases, act as thesis supervisor. Emeritii professors serve on graduate supervisory committees, and as co-supervisors of theses. Adjunct professors participate on graduate supervisory committees, and, in some cases, assist with field supervision of thesis research or supervision of summer internships in the M/F.C. program. They provide invaluable linkages to relevant agencies, organizations and research facilities beyond those described in section 4.5 (Collateral and Supporting Departments).

Table 2.1.1 Core members of the Faculty of Forestry

Name	M/F	Appt Type	Retirement /Contract End
Balsillie, D.	M	Contract	2006
Blake, T.	M	Tenured	2006
Bryan, R.	M	Tenured	2006
Carleton, T.	M	Tenured	
Caspersen, J.	M	Tenure-stream	
Cooper, P.	M	Tenured	
Kant, S.	M	Tenured	
Kenney, A.	M	Contract	2003
Laaksonen-Craig, S.	F	Tenure-stream	
Malcolm, J.	M	Tenured	
Martell, D.	M	Tenured	
Sain, M.	M	Tenured	
Smith, S.	F	Tenured	
Thomas, S.	M	Tenure-stream	
Timmer, V.	M	Tenured	2008
Yan, N.	F	Tenure-stream	
*TBA – CRC Tier II			
*TBA – CRC Tier I			

*TBA = to be appointed for July 1st, 2003

Graduate Cross Appointed Staff

Name	Home Department
Allen, G.	Chemical Engineering & Applied Chemistry
Berry, R.A.	Economics
Cowling, S.	Geography
Csillag, F.	Geography
Eckenwalder, J.E.	Botany
Fortin, M-J.	Zoology
Higgins, V.J.	Botany
Horgen, P.A.	Botany
McGregor, D.	Geography & Aboriginal Studies
Kortschot, M.	Chemical Engineering & Applied Chemistry
Price, A.G.	Geography
Reeve, D.W.	Chemical Engineering & Applied Chemistry
Sage, R.F.	Botany
Spelt, J.K.	Mechanical & Industrial Engineering
Stren, R.E.	Political Science
Vertinsky, I.	Faculty of Commerce, University of British Columbia
White, R.	Geography

Emeritii Staff

Name	Specialization
Aird, P.L.	Forest Policy
Balatinecz, J.J.	Wood Science
Carrow, J.R.	Entomology
Fayle, D.C.F.	Silviculture
Hubbes, M.	Forest Pathology
Nautiyal, J.C.	Forest Economics
Roy, D.N.	Wood Science
Zsuffa	Tree Genetics

Adjunct Staff

Name	Affiliation
Anderson, Harvey	Ontario Forest Research Institute, Ministry of Natural Resources
Bellocq, Isobel	FCEN, Univesidad de Buenos Aires
Columbo, Stephen J.	Ontario Forest Research Institute, Ministry of Natural Resources
deGroot, Peter	Natural Resources Canada, Canadian Forest Service
Duinker, Peter	Dalhousie University
Dumas, Michael T.	Natural Resources Canada, Canadian Forest Service
Fleming, Richard	Natural Resources Canada, Canadian Forest Service
Jeng, Robert	Faculty of Forestry, University of Toronto
Martinez, Alphonso, M.	Universidad Autonoma de Nuevo Leon
McLaughlin, David, L.	Ministry of Environment, Standards Development Branch

Adjunct Staff (cont'd)

Morin, Hubert	Université du Québec à Chicoutimi
Navar, Jose de Jesus	Universidad Autonmca de Nuevo Leon
Ray, Justina	Faculty of Forestry, University of Toronto
Régnière, Jacques	Canadian Forest Service
Sastry, Cherla	INBAR
Schleifenbaum, Peter C.	Haliburton Forest & Wild Life Reserve Limited
Spiecker, H.	Albert-Ludwigs-Universität Freiburg

Table 2.1.2 lists the core faculty members from the Faculty of Forestry, the Rotman School of Management, the Faculty of Law and the Institute of Policy Analysis who will participate in the Master of International Trade in Forest Products program. Letters of support from each of these units are included. Up-to-date curriculum vitae for all faculty members associated with the program are provided in Part 2.

Table 2.1.2 Faculty members who will participate in the Master of International Trade in Forest Products program

Faculty Name & Rank	M/ F	Retirement Date	Home Unit	Supervisory Privileges
Category 3				
Brean, D. Professor	M		Rotman School of Management	Full
Kant, S. Associate	M		Faculty of Forestry	Full
Laaksonen-Craig, S. Assistant	F		Faculty of Forestry	Full
Martell, D. Professor	M		Faculty of Forestry	Full
Mathewson, F. Professor	M	2008	Inst Policy Analysis/Dept of Economics	Full
Pauly, P. Professor	M		Rotman School of Management	Full
Trebilcock, M. Professor	M	2006	Faculty of Law	Full
Trefler, D. Professor	M		Rotman School of Management	Full
Vertinsky, I. Professor	M	2008	University of British Columbia	Full
Category 4				
Balsillie, D. Associate	M	2006	Faculty of Forestry	Full

Category 1: tenured or tenure-track core faculty members whose graduate involvement is exclusively in the graduate program under review. For this purpose the master's and doctoral streams of a program are considered as a single program.

Category 2: non-tenure-track core faculty members whose graduate involvement is exclusively in the graduate program under review.

Category 3: tenured or tenure-track core faculty members who are involved in teaching and/or supervision in other graduate program(s) in addition to being a core member of the graduate program under review.

Category 4: non-tenured or tenure-track core faculty members who are involved in teaching and/or supervision in other graduate program(s) in addition to being a core member of the graduate program under review.

Category 5: other core faculty: this category may include emeritus professors with supervisory privileges and persons appointed from government laboratories or industry as adjunct professors. Please explain who would fall into this category at your institution.

Category 6: non-core faculty who participate in the teaching of graduate courses.

Table 2.1.3 Lists the members of the external advisory panel attached to the program

Clark Binkley	Managing Director and CIO, Hancock Timber Resource Group Boston, U.S.A.
Allen Chan	Chairman and CEO, Sino-Forest Corporation, Toronto and Hong Kong
Fredrik Daveby	Kronoborgs Forsakringar, Vaxjo, Sweden (former Director, Government Relations, Sodra, Vaxjo, and former Forestry & Agricultural Trade Secretary, Swedish Embassy, Washington)
Chris Elliott	Director, Forests for Life, WWF International, Gland, Switzerland
Jim Farrell	Director, International Affairs, Canadian Forestry Service, Government of Canada, Ottawa
Mike Fullerton	International Affairs, Canadian Forestry Service, Government of Canada, Ottawa
Carl Grenier	Vice-President and General Manager, Free Trade Lumber Council, Montreal
Timo Heikka	Vice-President, Corporate Strategy and Investments, Stora Enso, Helsinki, Sweden
Katherine McGuire	Director, International Trade Branch, Ontario Ministry of Economics, Trade and Tourism

Jagmohan Maini	Consultant (former General Secretary, World Council on Forests and Sustainable Development, United Nations, New York)
Sten Nilsson	Deputy Director, Leader, Forest Resources Project, International Institute of Advanced Systems Analysis, Laxenburg, Austria
Bob Rae	Solicitor, Goodman, Phillips & Vineberg; Legal counsel for the Free Trade Lumber Council (and former Premier of Ontario)

All program coordination and the bulk of the teaching in the M.T.F.P. program will be carried out by the members of the core faculty in the Faculty of Forestry. The faculty was granted a new tenure-stream professorial appointment, Professor Susanna Laaksonen-Craig, to act as overall Program Coordinator and the bulk (approximately 80%) of her instructional and supervisory commitments will relate to the program. Professor Shashi Kant is a tenured associate professor specializing in forest economics, and approximately 50% of his commitments will be linked to the program. Professor David Balsillie is a part-time contractual appointee, with particular expertise in policy analysis and sustainable forest certification. The long-term strategic plan for the Faculty calls for a full-time tenure-stream appointment in this area, as a retirement replacement, in 2006. Professor David Martell is a specialist in decision-making analysis and forest fire management. The teaching of this core group will be supplemented as appropriate in areas of special expertise by faculty from other administrative units, as for example, in the case of Professor Michael Trebilcock from the Faculty of Law. As noted in section 1.2, this core instructional group will be joined by members from the external international advisory panel. Approximately fifteen percent of each instructional module will consist of seminars or case studies presented by members of the panel.

2.2 External Funding

Table 2.2.1 shows the pattern of external research funding received by the faculty over the past seven years.

Year	Granting Councils	Industry	Government	Foundations		Other		Total
1996-97	213,798	184,519	387,130		*	1,235,431		2,020,878
1997-98	273,109	236,892	550,694	99,459		89,212		1,249,366
1998-99	248,268	131,900	220,922	60,000		138,184		799,274
1999-00	474,200	301,200	338,330	144,662		58,887		1,317,279
2000-01	409,752	67,800	1,016,815	186,500		59,383		1,740,250
2001-02	449,925	10,000	525,128	142,000		116,226		1,243,279
2002-03	330,181	50,000	474,299	235,423	*	687,095	**	1,776,998
Total	2,399,233	982,311	3,513,318	868,044		2,384,418		10,147,324

* includes CFI grant awarded but not yet received

** includes Ontario Heritage Trust matching grant. Also CIDA bi-lateral project grant shared with Department of Geography and Institute for Environmental Studies

Several features deserve comment. First, there is a marked decline in the amount of funding received from industry sources. This is in part due to the severe budgetary circumstances of the forest products industry, but is also a reflection of the progressive change in the major focus of the Faculty, from traditional forestry towards more broadly-based forest conservation. The second point to note is that the recent pattern of funding from granting councils has been affected by faculty hiring and replacement, with three new tenure-stream positions filled in the past twelve months. Each of these appointees has grant council applications pending. The figures for 2002-2003 are partial, and we do expect that the granting council figures will be significantly higher by the end of the reporting period, and will maintain the upward trend of external funding support. The seven year annual average for external funding is $1,449,721, and approximate per capita funding level of $96,648.

2.3 Graduate Supervision

The total number of graduate students currently enrolled in the Faculty is 98, 32 in the Master of Forest Conservation program, 23 in the M.Sc.F. program, and 43 in the Ph.D. program. The last two programs are research and thesis-based. The pattern of enrollment over the past seven years in all these programs is shown in Table 2.3.1a. The planned equilibrium enrollment target for the Faculty in thesis-based programs is 5 per F.T.E. faculty member. The current faculty complement is 14.5 F.T.E. so the current ratio is 4.55/F.T.E. This reflects the fact that four tenure-stream faculty have been hired in the past eighteen months, and are still building their graduate groups. The eventual equilibrium complement will be 15.5, and the overall target enrollment for thesis-based programs will be 77.

Table 2.3.1a Enrollment in Graduate Programs in the Faculty of Forestry

	M.F.C.	**M.Sc.F.**	**Ph.D.**
1996-97	12	27	32
1997-98	25	23	34
1998-99	31	26	29
1999-00	38	27	31
2000-01	33	17	37
2001-02	23	18	47
2002-03	32	23	43

Current supervisory loads for the four core forestry faculty who will participate in the new program are shown in Table.2.3.1b.

Table 2.3.1b Supervisory load of core members of Faculty of Forestry Involved in M.T.F.P.

	Master's	Ph.D.
Balsillie, D.	1.0	1.0
Kant, S.	2.5	7.5
Laaksonen-Craig, S.	0.5	0
Martell, D.	2.0	3.0

2.4 Current Teaching Assignments

The Faculty administers and teaches all courses for the Master of Forest Conservation program and for the M.Sc.F. and Ph.D. programs in Forestry. It is also responsible two undergraduate programs in the Faculty of Arts and Science, Bachelor of Forest Conservation Science (B.Sc.) and Bachelor of Forest Conservation (B.A.), some of the constituent courses of which are taught by members of the Faculty. Some of these courses are taught every year, and some are taught in alternate years. Table 2.4.1 shows the number of courses and full course equivalents committed to each program, including those proposed for the Master of International Trade in Forest Products program.

Table 2.4.1 Courses currently listed by the Faculty to meet program requirements (Including seminar, reading and supervised research courses)

Program	Courses Listed	F.C.E.	F.C.E. Taught Annually
B.Sc./B.A.	20	10	5
M.F.C.	12	6	6
M.Sc.F., Ph.D.	31	15.5	9.5
M.T.F.P.	6*	6	6
Total	**69**	**37.5**	**23.5**

* Modules

There will be a small increase in the number of courses offered as recently hired faculty members assume their full targeted course load. Faculty members also teach 2.5 F.C.E. courses annually in other programs in the Faculty of Arts and Science. The equilibrium course load targeted in the Faculty's Strategic Plan and agreed with the Provost is 2.0 F.C.E's. The equilibrium faculty complement, before the appointment of the C.R.C. positions currently sought will be 14.1 F.T.E. providing a course load capability of 28.2 F.C.E. This is adequate to cover all program commitments, including the modules for the new program proposed. The addition of 1.5 F.T.E. C.R.C. appointments will add approximately 1.5 F.C.E. to the course load capability, reflecting the reduced course load expectations for research chairs.

The current course load commitments of those faculty members who will be involved in the program are shown in Table 4.2.2.

Table 2.4.2 Course loads of Faculty of Forestry faculty who are core members of the M.T.F.P.

	Current Load (FCEs)	Additional for M.T.F.P. (FCEs)	Total
Balsillie, D.	1.25	0.5	1.75
Kant, S.	1.25	0.5	1.7
Laaksonen-Craig, S.	0.25	1.5	1.75
Martell, D.	2.00	0.1	2.10

The data in Table 2.4.2 show that there is sufficient instructional capacity in the core group, particularly as they will be joined for part of each module by instructors from the Rotman School of Management, the Faculty of Law and the Institute of Policy Analysis and the University of British Columbia, as well as members of the International Advisory Panel.

3 PHYSICAL AND FINANCIAL RESOURCES

3.1 Library

Background

The University of Toronto libraries provide a rich resource for the support of graduate study in the field of international trade in forest products. While there is a specific literature that focuses on forestry and international trade which we collect extensively, the research collection in this area is enhanced by its location in a university library system which through its collections and acquisitions policy supports research and teaching in all areas of the sciences, social sciences and humanities. It is extremely difficult to draw firm boundaries around the area of international trade in forest products since much of the work in this area is cross-disciplinary. Researchers in this subject draw on literature that is more broadly based and diverse than other disciplines within the University.

Description of the Collection

Monographs

The largest collections of books relating to international trade in forest products at the University of Toronto can be found in the Noranda Earth Sciences Centre and the John P. Robarts Research Library. While the Noranda Earth Sciences Centre contains a strong collection of monographs and periodicals on all aspects of forestry, the Robarts Library houses a comprehensive collection covering all aspects of international trade and commerce.

The Library's holdings in the forest products trade specifically, and the sciences and social sciences more generally, have been built up in a systematic way since 1966 when Dealer Selection Orders were established and librarians employed to monitor the plans and to actively and systematically select research materials that fall outside the plans.

In the area of forest products trade, as in other areas of the collection, it is the policy of the Library to acquire a single copy of all books published in English that are considered to be of research value. This includes the proceedings of conferences and symposia, technical handbooks and reference tools in addition to research monographs. The cross-disciplinary nature of research in this area makes a simple evaluation of the Library's holdings difficult. However, it is possible to measure the collection as it relates to forestry by comparing our holdings with those described in "Primary monographs in forestry and agroforestry."[1] The University of Toronto Library holds 93% of the titles listed in this source.

Another measure of the collection's strength is to compare it to that of other similar North American institutions. Unfortunately the latest published statistics currently available for this were published in 1994.[2] These figures show the Library as having strong collections in the areas of forestry and

[1] McDonald, Peter. Primary monographs in forestry and agroforestry. In *The literature of forestry and agroforestry.* Edited by Peter McDonald and James Lassoie. Ithica,N.Y.: Cornell University Press, 1996, p.236-343.

[2] *North American title count: titles classified by Library of Congress and National Library of Medicine classifications.* Chicago: Association for Library Collections & Technical Services of the American Library Association, 1994.

international trade. Books dealing with forestry fall under the Library of Congress classification SD. The University of Toronto ranks fourth of the eighteen other North American libraries with over 1,200,000 titles. In the call number range HD 9000-9999, where much of the material specifically relating to trade in forest products is classed, the Library ranks fifth in this same group of academic libraries.

In 2001 the Library compiled current statistics covering all the collections across the University of Toronto. In total, the number of books in the forestry call number range SD was 5,085.[3] By contrast, the 1993 figure for the same call number range was 4,168 monographs. Similarly the number of books held in all university libraries in 2001 in the area of special industries and trades was 19,042. The 1993 figure for the same call number range was 15,380.

Journals

The journal holdings of the University of Toronto Library are substantial. However, like all North American libraries we are experiencing great difficulty in keeping up with the rising cost of serial subscriptions. From 1986 until the past few years we were able to buy few new titles. During the 1990's the Library, in consultation with faculty, actually cancelled subscriptions equal in cost to approximately 10% of the total serials budget. However, the situation has improved significantly during the past several years due to the Library's holdings of electronic journals. At the present time over 15,000 such journals are available to students and staff at the university. Many of these are new to the Library's holdings.

The Library holds 94% of the forestry journals listed in "Primary journals and serials in forestry and agroforestry."[4] A check of the ISI journal citation reports (2001) [5] for the subject area "Forestry" shows the Library holding in print or full text electronic version 23 of the top 25 ranked journals. There is unfortunately no equivalent ranked journal list for the area of international trade and finance. However, many of the journals in this area are listed by ISI under the heading "Business, Finance." Within this group the Library holds 23 of the top 25 ranked journals.

Electronic Resources

The electronic information services at the University of Toronto Library have been evolving since 1987, when the first online catalogue was mounted. Within a year the online catalogue was available in all the campus libraries, and dial-in access was introduced with a small number of lines. Abstracts and indexes had been computerized since the early 1970's and up until the 1980's were searched by trained intermediaries. Beginning in the late 1980's CD-ROM's and networked databases widened the access of electronic databases to the end-user to perform his or her own searches. Today the Library offers over 400 periodical index databases through a variety of information systems to all members of the University of Toronto community. Some of these indexes allow users to search and retrieve citations to journal articles and then to display the full text of that article electronically. Specialists studying international trade in forest products will find the following databases of interest: CAB Abstracts (which includes Forestry Abstracts), the Web of Science (which includes Science Citation Index and Social Science Citation

[3] University of Toronto Library. *The North American title count 2001 questionnaire.* Toronto: The Library, 2001.

[4] McDonald, Peter. Primary journals and serials in forestry and agroforestry. In *The literature of forestry and agroforestry.* Edited by Peter McDonald and James Lassoie. Ithica, N.Y.: Cornell Universty Press, 1996, p.344-361.

[5] ISI Journal Citation Reports, 2001. Philadelphia: Institute for Scientific Information, 2002.

Index), Agricola, Biological and Agricultural Index, ABI Inform Global, CBCA, NTIS, EconLit and PAIS.

As mentioned earlier the Library also offers the University of Toronto community access to 15,000 electronic journals, 60% of which have full text available.

Supporting Collections

As indicated above, the main collection relating to international trade in forest products is housed in the Noranda Earth Sciences Centre and the Robarts Library. A strong supporting collection of material relating to business and management is located in the Rotman Business Information Centre. Graduate students can also find a substantial amount of government and international agency literature relating to international trade in forest products in the Government Publications section of the Data, Maps and Government Information Services department, housed on the fifth floor of the Robarts Library.

Reference Services

Given the cross-disciplinary nature of the research in international trade in forest products, and the increasing importance of electronic resources, it is important to recognize that the reference and instructional services offered by the Library play a key role both in making our own collections accessible and in facilitating access to national and international information networks. The Library is increasingly playing an important role in the linking of teaching and research in the university.

Reference services offered at the Noranda Earth Sciences Centre and the Robarts Library include help in searching the collection, the verification of citations, training in the use of databases and electronic journals, the searching of online and print union list files to locate materials not available on campus, and the handling of interlibrary loans. For some locations it is now possible to process interlibrary loan transactions electronically thereby decreasing the time required to fill requests.

Budget and Commitment

The strength of the Library's financial commitment to purchasing material over the next five to seven years depends upon University policy and government funding. To date it has been the University of Toronto's stated policy to protect, as far as possible, the Library's acquisitions budget from rising costs and to maintain this protected status. This present financial policy allows the Library to maintain its current purchasing levels for publications relevant to the international trade in forest products and ensures continued support for the programme.

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November 1, 2002

3.2 Laboratory Facilities

Forestry's major in-house laboratory facilities and equipment are identified below under broad area headings.

Laboratory Facilities and Equipment

WOOD PHYSICS

Thelco oven (2)	Vacuum oven
Laminar flow hood	Fume hood (3)
Electronic balance (2)	Incubators, low and high temperature (2)
Vacuum desiccator	Controlled environment unit

WOOD/PLASTICS COMPOSITES

Atlas weather-ometer ES 25
Autopore III – porosometer w computer/printer
Fume hood
Autoclave
Environmental chamber
Isotemp oven

WOOD SCIENCE

Moisture meters (3)	Industrial dry kiln
Hot press	Tinius Olsen testing machine
Carver lab presses (3)	Disk refiner
Wabash press	Hammer mill and pulverizer

Zwick/Z100 materials testing machine w computer
Deffenbacher Hot Press w Pressman Control Sys.
Oxford Lab-X3000 analyzer
HP printer 2500 C+

WOOD ANATOMY

Image analysis system	Microtomes (3)
Research OmU2 ultramicrotome	Balances (top loading) (3)
Bausch & Lomb microscopes (4)	Swift professional microscopes (6)
Freezer	Refrigerator

High quality research microscopes: Reichert (fluorescence microscopy) with cameras

WILDLIFE ECOLOGY

Microscope (5)	Analytical balances (2)
Wild binoculars (6)	Artificial population sampler
Freezer	Fume hoods (2)

Assorted field equipment for population sampling

ENTOMOLOGY

Electronic balances (2)
Meteorological station (3)
Lambrecht Gthermohydrograph
Microcomputers (4)
Growth chambers (6)
Microwave oven
Refrigerators (2)
Microscopes (8)
Wild microscope with camera
Leitz microscopes (2)
Precision oven
Biorad electrophoresis
Freezer
Fume hood

HIGH SERVICE LAB

Electronic balances (8)
Other microscopes (4)
Fume hoods (3)
Buchler fraction collectors (4)
Laminar flow hood
Leitz microscopes (20)
Combustion oven
Desiccators (3)
Fisher ovens (2)

PATHOLOGY

Sterilgard hood
Vacuum pumps (4)
Labline orbit shakers (3)
IR spectrometer
Incubator
Brinkman rotovaporator
Eppendorf centrifuges (2)
Electrophoresis tanks (7)
DNA sub cells (6)
Leitz microscope
Zeiss spectrophotometers (4)
Sorvall centrifuge rotors (2)
IBI electrophoresis
DNA sequencer
Gel electrophoresis systems (2)
Electronic balances (5)
Analytical UV detector
Searle vortex evaporator
Sorvall ultracentrifuge
Fume hoods (2)
Shakerbaths (2)
Biorad fraction collectors (2)
Amicon ultrafiltration cell
Refrigerator
Thelco oven
Water bath
Biorad electrophoresis system
PCR thermal cyclers (2)

GENETICS

LKB knife maker
Precision oven
Eppendorf centrifuge
DNA thermal cycler
Freezers (2)
Icemaker
Minolta camera
Microwave oven
Fisher incubator (2)
Corning-760 fluorometer/densitometer
Explosion proof refrigerator
GCA incubators (3)
Microcomputers (3)
Incubators (3)
Polyvar Reichert research microscope
Electronic balances (3)
Haake water bath
Fume hoods (2)
Zenon de-ionizer

PHYSIOLOGY

Fume hoods (2)
Centrifugal pump
Incubator
Omnidata datalogger
Liquid scintillation counter
Reichert monocular microscopes (3)
Pressure bombs (2)
Microcomputers (3)
Porometers (2)
Liquid chromatography unit
Vernitron sterilizer
CO2 analyzer
Portable photosynthesis system
pH meters (3)
Beckman radioisotope detector
Buchi rotovapor
Li-cor portable area meter
Electronic balances (5)
Brinkman homogenizer
Varian gas chromatograph

WOOD CHEMISTRY

Fume hoods (3)
Wiley mills (2)
Hydrogenator
Adjustable thermo regulator
Leitz microscope
Chest freezers (3)
Shimadzu gas chromatograph
Refrigerator
Surface tensiometer 6000L
UV visible spectrophotometer
Lab ovens (2)
Thomas mill
Hitachi spectrophotometer
Shimadzu UV visible spectrophotometer
Refrigerators (2)
Analytical balances (6)
Beckman liquid chromatograph
Buchi rotovapor
X-ray fluorescence analyzer
Microcomputer

Dionex HPLC w computer
Dionex AD 25 Absorbance Detector
Dionex AS Automated Sampler

SILVICULTURE

Fume hood
Field sampling equipment
Tree Ring Increment Measurer (TRIM) system: consists of a video camera mounted on a microscope with a moving table connected to a Sony ruler. Driven by software running on an IBM computer, this is used for measuring tree rings on tree discs, producing growth analyses for individual trees.

Li-cor 6400
Ocean optics spectrometer
Digital cameras w fish eye lens (2)
Impulse Laser – field data acquisition
Data Logger w temp. & relative hum. Sensors
GPS units (3)
Desktop computers (2)
Balances (2)

SOILS

Electronic balances:
2 top loading and 2 analytical
AA spectrometer
Flame and graphite furnace
Fume hood
PYE spectrophotometers (2)
Kjeldahl units (3)
Hot air ovens (3)
Block digester
Double distiller
Auto sampler
Incubator
Muffle furnace
Miele dishwasher
Automatic diluters (2)
Microcomputers (3 MacIntosh SE's, 1 IBM)
Conductivity meter

PHOTOGRAMMETRY

Panasonic monitors (2)
Wild mirror stereoscopes (4)
Fairchild automation camera
Colour TV
Jena mirror stereoscopes (3)
JVC video camera
Abrams mirror stereoscope
Dietzgen mirror stereoscopes (3)
LMS linear measurement system
Parallax bars (14)
Sokkisha stereoscopes (5)

FIRE MANAGEMENT

3 top-end microcomputers running various analytical and statistical software.
1 SUN Sparcstation connected to University backbone.

GROWTH CHAMBER

Percival growth chamber
Conviron incubator
Refrigerator
Revco incubator
Conviron growth chambers (walk in) (2)
Coldstream controlled environment chamber
Chest freezer
Fisher incubator

FIELD EQUIPMENT

Suunto clinometers
Tree calipers
Chains (nylon, plastic, metal)
Compasses
Chainsaws
Tele-relaskop
Diameter tapes
Stereoscopes
Increment corers
Prisms
Cameras

WORKSHOP

An assortment of woodworking power tools: belt and disk sanders, table saw, jointer, radial arm saw, circular saws, planer and drill press, mitre saw.

AUDIO-VISUAL

Kodak slide projectors (8)
Video recorders/TV sets (2)
Overhead projectors (8)
Digital camera
Sharp video camera

INFOCUS on-line projectors - 1 portable, 1 ceiling mount (2)
Overhead projection panel

SHARED EQUIPMENT (ALL LABS)

Incubators (5)	Ultracentrifuge (65B Sorvall)
Freezers (2)	Lab dishwashers (2)
Autoclaves (2)	Growth chambers (2)
Superspeed centrifuge	Cold room walk-in units (2)
Refrigerators (3)	Refrigerated centrifuge
Biological freezers (2)	Distilling unit
Freeze dryers (2)	Industrial drying oven (1)
Dark room facilities	1 Field vehicle (15 passenger van)

3.3 Computer Facilities

The following is a description of Forestry's in-house computing facilities and resources and excerpts from the University's web pages describing some of the wide range of computer facilities and networks available to graduate students and staff.

Housing and Accessibility
The Faculty presently has two computer labs; the graduate computer lab is located in room 4000 with an undergraduate lab located in room 4001b. Both of these computer labs are accessible via a "Swipe Card" system. Students are able to access the labs at anytime with no restrictions on either the doors or their accounts. Keys to the building are distributed when they register so access to the building is year round. The graduate students are allowed to use the computer equipment in room 4001b but the undergraduates have priority.

Faculty Equipment
The Faculty has two main servers; the first machine is a Dell Pentium III running Windows NT and it is the primary server for the two computer labs. Each student has an account and disk space allowed on this machine. The second server is a Sun Microsystems Ultra II; this machine acts as the Faculties Web server but also functions as a high end computing machine for stats packages and the Faculty's GIS package.

a) Room 4000 (graduate lab)

This lab has twenty-one (21) computers ranging from Pentium II's to the higher end Pentium 4 machines. This lab has a HP 2100 LaserJet printer and a Lexmark 750 Colour Laser printer. Other equipment available is: a slide/photo scanner, a flatbed scanner and a Polaroid Slide Maker.

b) Room 4001b (undergraduate lab)

This lab has 12 Pentium III computers. It has a HP 4050 LaserJet printer and is also connected to the Lexmark 750 Colour Laser printer located in room 4000. This lab is also equipped with a flatbed scanner.

The Faculty will also connect any students' personal computer located in their office to the Faculty network and servers; this helps reduce the overcrowding issues that can sometimes arise in the labs.

Software
The computer labs have the following software installed on them:
Windows 98, Me or Windows 2000.
Office 2000 or Office XP
WordPerfect Office 2000
Sigmaplot
Arcview and Arcinfo (on a few computers only)
Procite
Adobe Products—Photoshop, Reader and writer.
SAS
DataDesk
Corel 10
Lindo
Ramas GIS
Norton Corporate Antivirus

Academic Computers
Each academic staff member will have his or her own computer and printer in their office; in addition their labs will also have 1-4 computers in it for research use.

Support Staff
The Faculty has one full time IT person on staff who oversees the day-to-day operations of the computers labs as well as all academic, administrative and research computer needs. These needs vary from repairing, diagnosing and purchasing Faculty computer equipment to helping individual staff or students with their computer problems.

Hours of Operation
Both computer labs are available 24 hours, 365 days of the year. The IT staff member is available 7:00 am until 3:30 pm daily and is also available on an "on call" basis if needed.

Age of Equipment
The average age of the computer equipment ranges from 3-4 years old to recent purchases. The Faculty makes every effort to maintain up-to-date computer facilities with a minimum purchase of 5 new computers every year.

Equipment Renewal
The average amount of money spent on computer and printer purchasing or upgrading and software purchases is approximately $35,000/year.

University Computing Facilities
An excerpt from the School of Graduate Studies 2002/03 Calendar introduces the wealth of computing resources available to graduate students in the University (Appendix II).

a) Information Commons

The Scotiabank Information Commons, located on the first floor of the Robarts Library, is a focal point at the University for electronic information access. Among many services, it offers media services, a design studio, and a help desk to support Internet and electronic mail access for all faculty, staff and students.

b) Resource Centre for Academic Technology (RCAT)

RCAT, located on the fourth floor of the Robarts Library, facilitates the development of effective teaching, learning, and research strategies based on emerging computer technologies. It supports individuals with special needs through the advancement of accessible information technologies.

A sampling of additional information extracted from the University's web site follows.

3.4 Space

The Faculty of Forestry is located on the St. George Campus in the Earth Sciences Centre. The Centre also houses the Departments of Botany and Geology, the Division of the Environment, the Institute for Environmental Studies and the Earth Sciences Library.

Forestry Space Summary	**M^2**
Lecture/seminar rooms	235
Teaching labs and support space	110
Computer lab and support space	95
Research labs and support space	1840
Academic staff offices	216
Research staff offices	48
Administrative/technical/general office space	140
Graduate student offices/lounge	470
Greenhouse facilities	147
Total	3401

In addition to the above, students and faculty conduct fieldwork and research at many sites, including (but not limited to) a soils erosion research lab located at Scarborough College and "Joker's Hill", the University's property on the Oak Ridges Moraine, a valuable site containing two Smithsonian biodiversity plots and over 200 ha of environmentally-sensitive hardwood forests and streams.

Additional teaching space, if needed, is available to Forestry through the University's Office of Space Management.

3.5 Financial Support

Information about funding support from various sources to graduate students over the past seven years is provided in Tables 3.5.1 and 3.5.2. Table 3.5.1 provides the total amount of all funding administered by the Faculty. It does not include funding provided directly to students for which detailed information (e.g. value) is not provided to the Faculty. It also does not include self-supported students, and does not include teaching assistantships which may be arranged by students with other divisions of the University, which are not administered by the Faculty.

External support includes NSERC Postgraduate and Industrial Postgraduate Scholarships and Ontario Graduate Scholarships, as well as students supported by e.g. the World Bank, I.D.R.C., C.I.D.A. or the National Centre of Excellence for Sustainable Forest Management.

University/departmental funding includes support from Connaught Scholarships, University of Toronto Open Fellowships, and other university-wide programmes administered through the School of Graduate Studies. Departmental fellowships include three endowed Ontario Graduate Scholarships in Science and Technology, administered through the Faculty, and other funds specifically directed to Forestry students including Graduate Fellowships in Forestry, the E.E. Johnson Forestry Fellowships and awards, and a number of smaller Faculty awards.

Teaching assistantships are provided for assistance with course instruction in the M.F.C. and undergraduate programs. Appointments are made according to the collective agreement with the Graduate Assistants Association, “Collective Agreement Between the University of Toronto and the Canadian Union of Public Employees, Local 3902”.

Research assistantships are provided by individual faculty members, but, as part of the funding arrangements agreed for full-funding of doctoral-stream cohort students discussed below, supervisors are required to commit research assistant funding to some students before enrollment in the Faculty is permitted.

The majority of external, University and departmental fellowships and awards are awarded competitively on the basis of academic excellence. The Faculty Awards and Admissions Committee, chaired by the Graduate Coordinator, ranks eligible students and provides recommendations for external awards such as NSERC and OGS, and University-wide awards, such as Connaught Fellowships. Internally administered fellowship awards are allocated based on academic performance and the terms of reference of the various award programs.

In 2001, the University adopted a policy of providing full funding support to students enrolled in the doctoral-stream cohort. This is defined by the University as students in the first year of a Master's program and the first four years of a Ph.D. program or five years in a Ph.D. program. Table 3.5.2 shows the funding allocated to students in this formal funding cohort. Funding for students in this cohort may consist entirely of scholarships, but in most cases in also includes teaching assistant and research assistant components. Where research assistantships are part of the funding package, supervisors are required to commit funding of either $7,000 or $12,000 per year for the complete cohort program period.

While the Faculty does not commit to a specific level of funding for students in M.Sc.F. and Ph.D. programs outside the funding cohort, every effort is made to provide the maximum possible funding to such students.

The Master of Forest Conservation program is a professionally-focused program of strictly limited duration. No formal funding commitment is provided to students entering this program, but some Faculty, research assistant and teaching assistant funding is provided wherever possible, and the Faculty also subsidizes some of the cost of field courses and internships. The Faculty is currently involved in campaign to raise endowment funding for entry scholarships to the M.F.C. program.

The Master of International Trade program is designed as a professionally-focused program, fully supported by fees. It is intended primarily for participants who are seconded to the program by employers, and at present no scholarship funding is allocated to the program. The structure of the program is such that will not be eligible for support from external programs such as NSERC or OGS, or from internal sources such as teaching assistantships.

The Faculty's document "Financial Support for Graduate Students" that supplements the more broadly-based information available from the School of Graduate Studies is provided as Appendix III.

Table 3.5.1 Financial Support of Graduate Students
M.F.C., M.Sc.F. and Ph.D.

Session	External* $	Univ/dept'l $	TA $	RA's	Total $	# Students	Avg $
1996-97	210,761	289,206	35,000	155,443	690,410	71	9,724
1997-98	114,337	302,700	35,000	105,989	558,026	82	6,805
1998-99	144,442	360,746	30,000	183,158	718,346	86	8,353
1999-00	135,957	479,627	25,000	234,312	874,896	98	8,928
2000-01	158,802	469,805	60,000	221,029	909,636	87	10,456
2001-02	223,900	400,832	80,000	331,073	1,035,805	88	11,771
2002-03	192,731	447,624	70,682	358,585	1,069,622	98	10,915

*Note re "External $": This amount excludes a number of external award holders (value unknown) and all self-supported candidates, i.e., those on paid employment/internships or educational leave, or similar external financial arrangement.

Table 3.5.2 Financial Support of Graduate Students in the Formal Funding Cohorts

Table 3.5.2a M.F.C., M.Sc.F. and Ph.D.

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		Univ/dept'l $								
Session	TA $	MFC	MScF/ PhD	External $ MFC/MScF/ PhD	Total $	MScF+ PhD enrol't #	MScF+ PhD cohort #	MFC enrol't #	Elig cohort + MFC enrol't #	Avg $/Eligible Student
1996-97	35,000	45,816	243,390	210,761	534,967	59	42	12	54	9,907
1997-98	35,000	65,457	237,243	114,337	452,037	57	38	25	63	7,175
1998-99	30,000	59,548	301,198	144,442	535,188	55	45	31	76	7,042
1999-00	25,000	76,857	402,770	135,957	640,584	60	41	38	79	8,109
2000-01	60,000	62,142	407,663	158,802	688,607	54	43	33	76	9,061
2001-02	80,000	38,994	361,838	223,900	704,732	65	52	23	75	9,396
2002-03	70,682	12,500	435,124	192,731	711,037	66	44	32	76	9,356

Table 3.5.2b M.Sc.F. and Ph.D.'s only

Session	TA $	Univ/dept'l $	*External $	Total $	MScF+ PhD enrol't #	MScF+ PhD cohort #	Avg $/cohort
1996-97	35,000	243,390	210,761	489,151	59	42	11,646
1997-98	35,000	237,243	114,337	386,580	57	38	10,173
1998-99	28,110	301,198	132,583	461,891	55	45	10,264
1999-00	24,072	402,770	128,051	554,893	60	41	13,534
2000-01	59,020	407,663	139,037	605,720	54	43	14,087
2001-02	75,275	361,838	208,900	646,013	65	52	12,423
2002-03	65,752	435,124	177,731	678,607	66	44	15,423

4 PROGRAM REGULATIONS AND COURSES

4.1 Intellectual Development and Educational Experience of the Student

The proposed Master of International Trade in Forest Products program differs greatly from that of other graduate programs in the Faculty of Forestry, in objectives, in the expected student body and in the mode of delivery. The objective, discussed at various points in the proposal, is to produce a small cadre of highly-qualified graduates who can provide high-level expert advice to governments, companies or non-governmental organizations involved in any aspect of the international forests products trade. The national and international importance of this trade and the need for such graduates has been discussed in the proposal, and is also commented upon by external letters, attached as an Appendix IV.

The structure of the program in six short, intensive residential modules obviously has advantages and disadvantages in terms of the intellectual development and educational experience of the students. Each module will essentially represent an intense, and probably tiring, immersion experience, in which students will have both the opportunity and the necessity to interact very closely with faculty and with other students. Separation of the modules is not only a professional requirement for the type of students expected, but also to provide an opportunity for more tranquil reflection on, and reading about, the material presented in each module. While this tranquil reflection is essential, it is also very important that frequent contact be maintained with instructors and with other members of the cohort. The nodal point for such interaction will be the Program Coordinator, Professor Laaksonen-Craig, but in addition each student will be assigned an individual mentor from amongst the core faculty. It will be the responsibility of each mentor to make contact on at least a weekly basis during the period between modules, to answer any questions (or direct them to a more appropriate source) and to facilitate access to sources of information required for program project requirements. The Faculty will also establish a web site specifically for each program cohort. Electronic contact will be established between members of the student cohort.

In order to progressively establish an effective professional network involving graduates from the program, the final research papers for each cohort, delivered publicly in the Faculty of Forestry, will be used as a workshop forum on international trade in forest products. All members of core faculty and as many members as possible of the international advisory panel, and all graduates of the program will be invited to these biennial presentations. It is expected that research papers will be published, either as an occasional series from the Faculty, or as special issues of appropriate professional journals, such as *The Forestry Chronicle.*

4.2 Program Regulations

4.2.1 Admission Requirements

Students applying to the program must hold a four-year bachelor's degree with at least mid-B standing during the final two years of an undergraduate program. As the issues involved in international trade span a wide range of disciplines, students may appropriately enter the program from diverse academic backgrounds. The value of the program will, in fact, be enhanced by the resulting diversity of

perspective. Most students will probably have undergraduate experience in forestry, wood science, economics, management, finance, forest product development, or engineering, but backgrounds in, for example, political science, anthropology, geography, or international studies would be equally appropriate. Admission is normally restricted to persons with significant relevant professional work or managerial experience. Applicants will be expected to provide a brief, clear statement about their objectives in applying to the program and its relationship to their career objectives.

4.2.2 Program Requirements

The program will involve six intensive, residential modules at approximately two-month intervals, delivered over a 16-month period. Each module will last one week (with one exception which will last eight days) and will involve approximately 42 instructional contact hours. The total contact instructional time for the program will be about 260 hours. Each module involves preparatory reading and one or several assignments which must be completed and submitted prior to the subsequent module. Satisfactory completion of each module is a pre-requisite for participation in subsequent modules. Program completion will also involve a major research paper or case study analysis which will be publicly presented in the Faculty of Forestry during the final module, and subsequently submitted in written form.

4.3 Part-Time Studies

The program is designed so that students proceed as members of a cohort. Only in exceptional circumstances, with the approval of the Program Director, will students be permitted to complete modules over more than one program cycle.

4.4 Total Graduate Courses Listed and Level

The total number of graduate courses currently listed in the Faculty of Forestry; apart from those proposed for the M.T.F.P. are 41. These are shown in Table 4.4.1.

Table 4.4.1 Graduate courses listed in the Faculty of Forestry

Course	Title	Weight	Offered (1=every year; 2= alternate years)
FOR1000F	Research Methods	0.5	1 (Compulsory in MScF)
FOR1001F	Graduate Seminar	0.5	1 (Compulsory in MScF & PhD)
FOR1060H	Soil Fertility and Nutrition	1.0	2
FOR1280 F	Wood Products and Processes	0.5	1
FOR1282S	Wood Chemistry	0.5	1
FOR1284F	Bonding & Adhesion Tech.	0.5	2
FOR1286S	Natural Fibre Prod. & Tech.	0.5	2

FOR 1288F	Wood Composite Processes	0.5	2
FOR1290S	Wood and Material Science	0.5	1
FOR 1292F	Long-term Performance & Dur.	0.5	2
JFE1300Y	Wood Engineering Internship	1.0	1
FOR1320F	Forests and Global Change	0.5	2
FOR1321F	Stand and Structure Dynamics	0.5	2
FOR1325F	Tree Biology and Arboriculture	0.5	2
FOR1331S	Advanced Forest Entomology	0.5	1
FOR1412F	Natural Resource Management I	0.5	2
FOR1413S	Natural Resource Management II	0.5	2
FOR1414F	Forest Fire Management Systems	0.5	1
FOR1415S	Decision-making for Management	0.5	1
JFG1417S	Dryland Environmental Management	0.5	2
JBF1436F	Forest Landscape Ecol. & Methods	0.5	1
FOR1460F	Community Forest Man. Systems	0.5	1
FOR1462S	Int. Trade, Envt. & Sus. Dev.	0.5	2
FOR1555F	Wildlife Ecology & Conservation	0.5	1
FOR1570S	Ecological Principles of Agroforestry	0.5	2
FOR1575F	Urban Forest Conservation	0.5	2
FOR1580F	Ecol., Man. & Cons. of Tropical Forests	0.5	1
FOR1610F	Forest Policy Development & Issues	0.5	1
FOR1900F	Advanced Topics in Forestry I	0.5	2
FOR1901S	Advanced Topics in Forestry II	0.5	2

Note: 3000 level Forestry courses are compulsory in the Master of Forest Conservation program, but with the exception of FOR 3007 and FOR 3008, may also be taken by research-stream students.

FOR3000F	Current Issues in Forest Conservation	0.5	1
FOR3001F	Biodiversity of Forest Organisms	0.5	1
FOR3002F	Applied Forest Ecology and Silviculture	0.5	1
FOR3003F	Socioeconomic Influence on Forest Ecos.	0.5	1
FOR3004S	Forest Decision Management Support	0.5	1
FOR3005S	Stresses in the Forest Environment	0.5	1
FOR3006H	Case Study Analysis in Forest Cons.	0.5	1
FOR3007H	Forest Conservation Internship	0.5	1
FOR3008H	Forest Conservation Research Paper	0.5	1
FOR3009S	Global Forest Ecosystem Conservation	0.5	1
FOR3010S	Sustainable Forest Management & Cert.	0.5	1
FOR3011S	International Field Camp.	0.5	1

Each module for the M.T.F.P. program constitutes an individual course. Detailed course descriptions are provided as Appendix V.

Collateral and Supporting Departments

The key collateral academic divisions of the University which will be involved with the M.T.F.P. are the Rotman School of Management, the Faculty of Law and the Institute of Policy Analysis. The Faculty of Forestry also enjoys very close collaboration with the Department of Geography, the Department of Botany, the Department of Zoology in the Faculty of Arts and Science, the Departments of Chemical Engineering and Applied Chemistry and the Department of Mechanical and Industrial Engineering in the Faculty of Applied Science and Engineering, and with the Institute of Environmental Studies and the Pulp and Paper Institute. These collaborative linkages involve supervision of M.Sc. and Ph.D. students and participation on supervisory committees, guest lecturing and course participation and research collaboration.

5 OUTCOMES

5.1 Enrolment and Graduates

The Faculty of Forestry is a graduate faculty and a department of the School of Graduate Studies at the University of Toronto. Enrollment patterns in the existing M.F.C., M.Sc.F. and Ph.D. programs have been shown in Table 2.3.1a.

5.1.1 Master's

The M.F.C. and the M.Sc.F. programs are entirely distinct. The M.F.C. is a "professionally-focused" intensive 16-month program for students who plan to pursue a career in practical forest conservation. The equilibrium student intake target, agreed with the University when the program was introduced in 1996 was 15. As a conceptually new and unique program, it has taken some time for establishment of a clear niche amongst forestry offerings, and the actual intake has fluctuated around this target figure, and reached 21 in the current year. Graduation occurs at the end of the fall semester. By December, 2001, 72 students had graduated from the program. Although the M.F.C. was designed as a terminal degree, the quality of students entering the program has been such that 5 have continued to doctoral studies at the University of Toronto and other institutions.

The M.Sc.F. has traditionally attracted two groups of students: those who have research interests, but do not aspire to doctoral studies; those who see it as a stepping stone for doctoral studies. Both are appropriate, and reflect realistic career objectives. In the past these groups have been rather equally balanced, but the current University-wide model for graduate student funding, with funding only for one year of master's level study will tend to alter this balance in favour of students intent on doctoral studies. Amongst, some students complete their M.Sc.F. before starting a doctoral program, while others apply to the Faculty Graduate Admissions and Awards committee to transfer into the doctoral program at the end of their first year. The distinction between these directions has usually been the nature of the research being undertaken, and whether or not the student wishes to change their field of orientation for doctoral research. Again, changes in the funding model will certainly increase the proportion of students transferring to the Ph.D. program.

5.1.2 Doctoral

Enrollment in the Ph.D. program has shown a steady increase up to the present year. The slight decline in the present year reflects both recent graduations and faculty transition; a number of a number of recent graduates were supervised by faculty who have recently retired, while the three tenure-stream faculty hired during the past fourteen months have not yet built up a cohort of doctoral students. As a result of the current faculty hiring and the change in the funding model, we would expect the general upward trend to be continued for several more years, to reach an equilibrium level around 62 students. This is a conservative figure in view of the increasing demand in the forest and academic sectors. It is, however, one that is constrained by available supervisory capacity and funding support.

5.2 Projected Graduate Enrolments

The normal cap for admission in the Master of Forest Conservation program is 20. This figure reflects experience with the program since its introduction in 1996, and is constrained by the pedagogic methods used, by resources available to support field courses, and by the availability of high quality internships for students. An annual intake of 20 students in a sixteen month program would yield a November 1st enrolment of 40 students. The acceptance rate for applicants to the program is declining, as the program becomes increasingly well-known, and is currently around 50%

The planned equilibrium target enrollment for research programs is 5 students per full-time faculty member. While a precise target ratio between M.Sc.F. and Ph.D. students has not been set, it is expected that this will stabilize around 1:4, though the exact ratio will depend on whether most students enter the doctoral program directly, or via the M.Sc.F. With the present faculty complement (including positions to be filled during the next eight months), this yields an approximate target graduate enrolment of about 62 Ph.D. students and 15 M.Sc.F. students.

The target enrollment for the Master of International Trade in Forest Products program is 5 -10 students per program cycle, with a maximum cap of 12 students.