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I. CHARGE TO REVIEW COMMITTEE

I-1 Charge to Review Committee

July 30, 2004

Charge to the Peer Review Team

I write to provide you with background on the Forest Science Department at Texas A&M University and to explain the expectations for the external review.

The first Ph.D. in Forestry was granted in 1965 while the program was under the Department of Range Management, a department that combined range science and forestry disciplines. The Department of Forest Science was established as an individual unit in 1969. Forest Science is currently one of fourteen departments in the Agriculture Program, and one of four departments in the Institute of Renewable Natural Resources (IRNR). The enlightened and ethical stewardship of forest resources is the overarching and timeless principle that guides the formulation of educational, research, and outreach goals of the Department of Forest Science.

Although this review is part of a periodic review of all Texas A&M University doctoral programs, this type of review offers an excellent opportunity to identify ways to maintain the current high standards of the programs and to learn from review team members' experiences with similar programs.

I request that the review team examine the doctoral programs within the Department of Forest Science using the materials that will be provided, along with any additional information you might request. While evaluating the existing program, please consider the allocation of resources, (i.e., human and fiscal) within the department, the absolute level of support the Department receives from the University, and comment as appropriate on current and potential "leveraging" of these resources. Enclosed in our "guidelines" is a suggested doctoral review report format. This format has proven successful in previous intercollegiate faculty reviews, and I include it only for your edification.

I look forward to meeting with you and the entire committee in October. If you have any questions or require additional information, please do not hesitate to let me know.

pc: Fuller Bazer, TAMU 2135
   Charles T. Smith, TAMU 2133
I-2  Review Team Itinerary

Sunday, 31 October 2004

Travel and Welcome. Faculty will pick up Team as they arrive and escort to hotel.

<table>
<thead>
<tr>
<th>Review Team</th>
<th>Arrival Time</th>
<th>Carrier &amp; Flight #</th>
<th>Faculty Escort</th>
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<tbody>
<tr>
<td>Dr. Robert Teskey</td>
<td>6:03 p.m. 31 Oct 04</td>
<td>AA 3397</td>
<td>Dr. Tat Smith</td>
</tr>
<tr>
<td>Dr. Alan Ek</td>
<td>1:58 p.m. 31 Oct 04</td>
<td>AA 3345</td>
<td>Dr. Tat Smith</td>
</tr>
<tr>
<td>Dr. Timothy White</td>
<td>1:52 p.m. 31 Oct 04</td>
<td>CO 9554</td>
<td>Dr. Tat Smith</td>
</tr>
</tbody>
</table>

7:00 p.m.    Dr. Tat Smith will pick up Team and escort to welcome dinner and return them to hotel after dinner.
7:30 p.m.    Dinner Smith and Review Team, Eriksson & Popescu – Oxford Street

Monday, 1 November

7:10 a.m.    Dr. Rick Giardino, Dean of Graduate Studies will pick up the Team and escort them to entry breakfast meeting with Executive Vice President and Provost.
7:30 a.m.    Meet with Dr. David Prior, Executive Vice President and Provost, and Dr. Rick Giardino, Dean of Graduate Studies, Provost Conference Room, Rudder 900 (Campus Catering)
8:30 a.m.    Dr. Tat Smith will escorted Team to Dean’s Office, COALS
9:00 a.m.    Meet with Dr. Fuller Bazer, Associate Vice Chancellor & Executive Associate Dean, College of Agriculture & Life Sciences, 113 Williams Administration Building.
10:00 a.m.   Dr. Tat Smith will escort Team to Department, 303 HFSB.
10:15 a.m.   Meeting with Drs. Tat Smith, Department Head, Carol Loopstra, Associate Head for Graduate Programs, and Graduate Program Committee Members - Dr. Jean Gould, Dr. Marian Eriksson, Dr. Sorin Popescu, & Dr. Todd Watson, Room 303 HFSB.
11:15 a.m.   Team departs to Faculty Club to have lunch meeting with department heads and Executive Associate Dean.
1:00 p.m.    Meet with forest genetics & biotechnology faculty, Room 303 HFSB.
2:00 p.m.    Meet with sustainable forest ecology & management faculty, room 303 HFSB.
3:00 p.m.    Meet with forest resource decision sciences faculty, Room 303 HFSB.
4:00 p.m.    Meet with urban & community forestry faculty, ROOM 303 HFSB.
5:15 p.m.    Reception with all Department faculty – HFSB Atrium (Food Service)
6:45 p.m.    Dr. Tat Smith and Graduate Program Committee faculty will join Team for dinner. Team will return to hotel for work session following dinner.
Tuesday, 2 November

7:00 a.m. Team to have breakfast on their own at hotel.
7:45 a.m. Dr. Tat Smith will pick up Team and escort to 303 HFSB.
8:15 a.m. Tour Borlaug Center (Dr. Loopstra to host).
9:15 a.m. Tour Forest Sciences Laboratory.
10:15 a.m. Dr. Tat Smith will escort to Spatial Sciences Laboratory to meet with Spatial Sciences faculty, Centeq Building.
11:30 a.m. Lunch and meet with Graduate Students, Room 303 HFSB.
1:30 p.m. Meet with Graduate Program Committee (GPC) to discuss recruiting, admissions, and funding, Room 303 HFSB.
2:30 p.m. Dr. Tat Smith will escort to hotel
2:45 p.m. Work session for Team
6:00 p.m. Team will get dinner at McAlister's, continue work session.

Wednesday, 3 November

Team will pack and check luggage at front desk of hotel.

7:15 a.m. Dr. Giardino will pickup Team and escort to exit breakfast meeting with Provost, Dean of Graduate Studies, and Executive Associate Dean, College of Agriculture and Life Sciences.
7:30 a.m. Exit meeting with Dr. David Prior, Executive Vice President and Provost, Fuller Bazer, Associate Vice Chancellor and Executive Associate Dean, College of Agriculture and Life Sciences, and Dr. Rick Giardino, Dean of Graduate Studies, Provost Conference Room, Rudder 900. (Campus Catering).
9:00 a.m. Dr. Tat Smith will pick up the Team and escort to HFSB.
9:15 a.m. Team briefs Dr. Tat Smith, Room 303 HFSB.
10:00 a.m. Prepare for presentation of report. Team makes final changes to draft report.
10:45 a.m. Team presents report to department faculty, staff, and students, Room 303 HFSB.
12:00 p.m. Lunch with Dr. Tat Smith and GPC, Room 303 HFSB.(Jason's Deli)
1:00 p.m. Team returns to hotel and prepares for departure.

<table>
<thead>
<tr>
<th>Review Team</th>
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<tr>
<td>Dr. Alan Ek</td>
<td>2:25 p.m. 3 Nov 04</td>
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<td>Dr. Tat Smith</td>
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<tr>
<td>Dr. Timothy White</td>
<td>1:08 p.m. 3 Nov 04</td>
<td>CO 9554</td>
<td>Dr. Tat Smith</td>
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II. FORESTRY PROGRAM GOALS, OBJECTIVES, AND POLICIES

II-1 Texas A&M University

Texas A&M University provides an outstanding intellectual environment for forestry education. Texas A&M opened on October 4, 1876, as the state’s first public institution of higher education. In 1963, the name changed to Texas A&M University because the curriculum grew to include architecture, business, education, geosciences, liberal arts, medicine, science, and veterinary medicine, as well as agriculture and engineering. Today, Texas A&M University is a land-grant, sea-grant, and space-grant institution with a Spring 2004 enrollment of approximately 41,600 students studying for degrees in 10 academic colleges. The colleges of Agriculture and Life Sciences, Business, Engineering, and Veterinary Medicine are frequently cited as among the very best in the nation. Texas A&M University also advanced to the top tier of doctoral-granting national universities in the 2002 edition of America's Best Colleges published by U.S News & World Report. Most importantly, the University maintains an intellectual environment that protects freedom of inquiry, rewards innovation, and provides the highest quality undergraduate and graduate programs.

Mission and Goals

The mission of Texas A&M University is to achieve academic, research, and service excellence; teaching excellence; and leadership and citizenship development for students and all associated with the university. To that end, Texas A&M University’s Vision 2020 sets the goal of being recognized as one of the ten best public universities in the nation. Vision 2020 also seeks to attract and nurture a more ethnically, culturally, and geographically diverse faculty, staff, and student body.

II-2 Department of Forest Science

The Department of Forest Science was established as an individual unit in 1969. This unit emerged from a former department that combined range science and forestry disciplines. The first Ph.D. in forestry was awarded in 1965 while the program was under the Department of Range Management. Forest Science is currently one of fourteen departments in the Agriculture Program, and one of four departments in the Institute of Renewable Natural Resources (IRNR). The Department of Forest Science is unique among departments in the Agriculture Program. The Department and The Texas Forest Service (TFS) are both forestry programs within the Texas A&M University System. Having the state forestry agency as a part of the service arm of the university system offers distinct advantages to the Department and TFS.

Mission, Goals, and Objectives

Texas A&M University is a land-grant institution that seeks to fulfill its tripartite responsibility for teaching, research, and service. Therefore, the Department’s mission is to prepare a diverse
student body for professional and scientific leadership roles in the management, conservation, and restoration of forests throughout the world, and to generate, disseminate, and apply new knowledge and technology essential to the practice of sustainable forestry and resource management. This also requires a commitment to hiring and retaining the highest quality faculty available in the nation.

The enlightened and ethical stewardship of forest resources is the overarching and timeless principle that guides the formulation of educational, research, and outreach goals of the Department of Forest Science. Therefore, the Department’s goals undergo continuous review to assess their consistency with this principle and to ensure that they respond to the needs of the profession, clientele groups, the state, and the nation.

The mission, goals, objectives, and curricula of the Department are widely publicized in such places as the undergraduate and graduate catalogs, the Department’s web site <http://forestry.tamu.edu>, annual research reports, brochures, and other public documents.

Education

The Department of Forest Science provides an interdisciplinary education because forests consist of more than trees. A forest is an aggregate of plants, animals, and microorganisms within an ecosystem dominated by trees. Therefore, foresters must understand the whole forest to manage it. Above all, foresters must appreciate the broader context of forest management and be able to plan with a long-term perspective that can sometimes reach a century or more into the future.

Few professions require such a high degree of knowledge integration from other disciplines. Still fewer professions require such a thorough understanding of something as complex and dynamic as a living forest. Forestry is a unique profession that requires a unique education. The Department constantly strives to meet the challenge of educating knowledgeable, skillful, and responsible professional foresters and resource managers. This also requires the Department to provide a dynamic and exciting intellectual environment that draws capable and motivated undergraduate and graduate students from a variety of cultural, ethnic, and geographical backgrounds.

Education goals:

- Ensure that the forestry education offered provides students with the best possible foundation for a productive professional life and constructive participation in society.

- Provide traditional forestry students with a high quality interdisciplinary education that includes an in-depth understanding of (1) the biotic and abiotic components of a forest, (2) the relationships that tie them together, and (3) the technologies and techniques available to intervene in those relationships to achieve specified goals and assess the consequences of intervention.
- Provide non-traditional forestry students with a high-quality education in specialized areas of forest resource management such as genetics and biotechnology, international forestry, geometrics and spatial sciences, information technology, silviculture, fire management, forest ecology, restoration forestry, soils, forest economics and policy, forest industries, forest products, urban forestry, decision making, marketing, and others.

- Provide traditional and non-traditional forestry students with an education that includes (1) writing, thinking, and self-expression skills needed for collaborative decision making and communication, (2) analytical skills needed to understand and conduct scientific research, and (3) the historical, cultural, political, economic, legal, institutional, and global context in which resource management occurs.

- Provide students with modern teaching facilities that include up-to-date classrooms and laboratories, library materials, and computer equipment and services.

Educational objectives specifically related to the graduate program are located in section III-2.

Research

Scholarship is the foundation of quality teaching, research, and service. The Department seeks to generate scholarship that is uncompromising in its commitment to excellence. The act of discovery is essential and complementary to the teaching of new ideas and sharing thoughts and concepts with the scientific community and society. This includes basic and applied research because the Department must look to the future and promote wise stewardship in the present. Faculty research can be organized into six broad research areas, including forest genetics and biotechnology, sustainable forest ecology and management, forest resource decision sciences, urban and community forestry, forest products and services, and spatial sciences (see also matrix of faculty research expertise in Table IV-1).

Research goals:
- Select and develop priority disciplinary and interdisciplinary research and scholarly programs acknowledged important to sustainable and socially responsible forest and resource management on a national and global level.

- Provide faculty and graduate students with up-to-date laboratory facilities, scientific and computer equipment, and other support services essential for conducting research of national and global importance.

Service

The Department’s service responsibilities rest with research and teaching faculty as well as extension faculty because of Texas A&M University’s land-grant heritage. This requires providing urban and rural citizens of Texas and the nation with up-to-date and scientifically
credible information about forest stewardship and forest products and services that aid them in making responsible forest and resource management decisions.

Service goals:
- Enhance public knowledge about forestry to help citizens make more informed resource management decisions.

- Translate academic and research discoveries of technologies, new products or services, or other findings that impact human lives and the physical environment, into a form that may have practical uses in resource management by social institutions, including government agencies, non-profit organizations, and industry.

- Actively participate in the transfer of findings of scholarship in forestry and resource management to useful applications for social benefits through publications, outreach programs and professional, governmental, and other services.

- Serve as a catalyst to strengthen relationships among the public, professionals, research scientists, state and federal agencies, and industrial and private organizations with interest and involvement in forestry.

II-3 How Departmental Objectives Respond to Needs of Constituencies

The Department serves internal and external clients. The former are those who participate in educational programs or colleagues who assist in providing those programs. The most important internal clients are students and their families. They expect the Department to provide a quality education using the latest knowledge, and they anticipate placement upon graduation. Internal clientele also include former students and other faculty.

External clients expect quality research, new technology, timely and relevant information, and knowledgeable and skilled employees. They include forest products industries, state and federal agencies, municipal governments, other forestry professionals and consultants, universities, contractors, tree breeders, growers, forest users, policymakers, and citizens of Texas and the nation. Each client has specific expectations that the Department must serve within the limits of existing resources and expertise.

In addition, the Department and the forestry profession must respond to major influences in the ecological, cultural, political, and economic environment. To that end, faculty compiled a brief but growing list of influences that represent important challenges for achieving the Department’s mission. This list is updated each year as circumstances change to provide further guidance for improving education, research, and service objectives and programs.

The current list of major influences affecting the Department’s goals and objectives in alphabetical order is:
• Accelerating changes in biological, information, and other technologies
• Decline of native forests and forest health
• Declining public knowledge of forests
• Declining public support for active forest management
• Eco-terrorism
• Ethnic and cultural diversification of society
• Global climate change
• Growing national demand for amenity products and biodiversity
• Growing worldwide demand for forest products and services
• Increasing damage to forests and communities from unnatural massive wildfires
• Increasing immigration into forests
• Increasing need to produce more wood and fiber from industrial and private non-industrial forests to compensate for reductions in output from public lands and to buffer against growing imports
• Increasing pressure to find more natural ways to manage public and private forests
• Increasing urbanization and associated deforestation
• Internationalization of the forest products industry and the nation’s economy
• Rapid deforestation in developing countries

The Department’s goals and objectives also reflect information in such documents as the SAF Task Force on Forestry Education Accreditation report of 2000; A National Investment in Sustainable Forestry prepared by the National Coalition for Sustaining America’s Nonfederal Forests in 2001; the USDA Forest Service’s Southern Forest Resource Assessment of 2001; the National Capacity in Forestry Research report published by the National Research Council in 2002; and other documents.

II-4 Assessing Achievement of Departmental Objectives

In 1997, the faculty prepared a report titled “A Blueprint for the Future” that provided specific goals and objectives for teaching, research, service, and other functions of the Department of Forest Science. The collaborative process involved a series of weekly workshops that prepared the foundation for a two-day retreat. The faculty reviewed and approved the final report. This report led to the hiring of a new Department Head and a new direction for the Department, as well as the creation of a Forestry Alumni Committee and newsletter, and an Individually Designed Program Committee for non-traditional forestry education.

The Department also sponsored a Visioning Workshop in 1999 to update its goals and objectives, and to improve its performance in meeting those objectives. Participants came from the University, state and federal agencies, the private sector, and environmental organizations. Further consultation with clientele groups and the faculty led to the publication of a Strategic Plan for the Department that responded to the University’s 2001 Strategic Plan. This was followed in 2002 by a two-year progress report assessing the Department’s performance in meeting Agriculture Program 21 priority goals.
Highlights of accomplishments in achieving the Department’s goals and objectives for education, research, and service follow:

- Course and curriculum revisions that provide fewer total hours and greater integration in the Forest Resource Management option were approved.

- Strategic planning has been completed for revisions creating the Urban Forestry and Arboriculture options and the Forest Resources option (formerly Individually Designed Program (IDP)) to address the needs of non-traditional forestry students.

- A new degree program in Spatial Sciences has been approved by the Board of Regents and has been submitted to Texas Higher Education Coordinating Board for final approval.

- An additional undergraduate degree program related to wood products and process engineering is anticipated.

- The Department is collaborating with Geography in recently approved graduate certificates in Geographic Information Systems and Remote Sensing.

- The Department completed the first year of assessing the performance of undergraduate and graduate degree programs towards review by the Southern Association of Colleges and Schools (SACS) in Spring 2002.

- Substantial increases in the use of web-based instructional materials for nine undergraduate and graduate courses.

- New facilities are now available for the Spatial Sciences Laboratory.

- Undergraduate enrollment has increased.

- Approval of a new student club titled Texas Aggie Student Society of Arboriculture.

- New scholarship gifts were received, including the G.G. “Hoot” Gibson ’29 and Mary Gibson Forestry Scholarship of $50,000 matched 1:1 by the A&M Foundation, and the James M. Carder Endowed Fund of $250,000. A new Laverne Addison Endowment for Undergraduate Scholarships was established in the amount of $25,000 by the John Easley Family. There was also an increase in existing International Society of Arboriculture scholarships. Two recent grants from the Sturgis Foundation total $60,000 in support of summer camp programs.

- Student performance, as indicated by grade point ratio, has increased steadily since 1996.
• The Department has established memoranda of agreement with three universities overseas to facilitate international collaboration in all programmatic areas of teaching, research and service. The three universities are Nanjing Forestry University in China, August Cieszkowski Agricultural University of Poznan, Poland, and Fachhochschule Wiesbaden University of Applied Sciences, Wiesbaden, Germany.

II-5 ORGANIZATION AND ADMINISTRATION OF THE FORESTRY PROGRAM

Texas A&M University System Organization and Governance

Texas A&M University is the Federal Land Grant University of Texas, a designation given by the Texas Legislature on 17 April 1871. Texas A&M University is administered by a board of regents, chancellor, a president, eight vice presidents, twelve deans, and the Executive Vice President and Provost (Figure II-1).

The Governor with the approval of the State Senate appoints members of the Board of Regents. The Board of Regents has responsibility to “provide the policy direction for the System and its component universities, agencies and the health science center”. The Board has “legal responsibilities of a fiduciary in the management of funds under the control of the institutions subject to the Board’s control and management”. The Board has the responsibility of appointment of the President of the component institutions, based upon the recommendation of the Chancellor. The President is responsible to the Board for the execution of policies and management of Texas A&M University.
Figure II-1. The organizational structure of the Texas A&M University System.

The President has complete legal and financial management authority of the Texas A&M University component (Figure II-2). The Chancellor upon recommendation by the President and Provost, who oversees all academic programs, appoints the college deans.
The finances of the University are administered by the Texas A&M University, Division of Finance, under the leadership of the Vice President for Finance (Figure II-3). The Office of the Vice President for Student Affairs serves and supports the students, student families, former students, administration, staff, and faculty of Texas A&M University. The Vice President for Governmental Affairs has primary responsibility for legislative, congressional, and external affairs. The Vice President for Administration oversees the facilities and services throughout the University. The Vice President for Development has the responsibility for fund raising. The Vice President for Research is charged with the responsibility to provide leadership and coordination in the development, implementation, operation and assessment of programs that support creative scholarship, graduate studies and sponsored research throughout Texas A&M University.
Figure II-3. The structure of responsibility for fiscal matters within Texas A&M University.

The Deans, Vice President for Research, and the Executive, Associate, and Assistant Provosts report to the Executive Vice President and Provost. Libraries, institutional studies & planning, press operations, admissions, registrar, computing and information services, broadcast service, distance education, media service, instructional technology, administrative services, military science, international programs and undergraduate programs, as well as academic services, are all managed through the Provost office.

Each dean is responsible for all aspects of the management of their respective colleges, including financial, undergraduate and graduate instruction, research, and public service activities and programs. The mission and goals and responsibility for attainment of the same are the responsibility of the respective dean.

The College of Agriculture and Life Sciences is administered by a joint appointment as Vice Chancellor of Agriculture and Life Science and Dean of the College of Agriculture and Life Sciences (Figure II-4). The position provides overall leadership for the Agriculture Program
which is an organization of statewide agricultural agencies, divisions or colleges of agriculture, life sciences, natural resources, human sciences and veterinary medicine within the A&M System. The top administrative team includes an executive associate dean and four associate deans. Each of fourteen departments within the College is lead by a department head that is recommended by the faculty and appointed by the dean of the College, the Dean of Faculties, Provost, and the President.

The department head is the leader of the faculty in each department and represents the department to the college and university administration (Figure II-5).

Figure II-4. The organizational chart of the Agricultural Program and its units.

The head is the chief administrative officer, bearing responsibility for the finances, academic and research pursuits, as well as the service areas of the unit. The head articulates the planning and visioning of the group of scholars and engages the assistance of internal and external partners and advisors to advance the strategic mission of the department. The department head is also responsible for assessing the performance of faculty and staff and represents the interests of the department to external clientele groups and legislative bodies. The department head is charged with communicating the policies and procedures of the College and the University to the faculty.
Within the department, the faculty establishes working committees that provide active participation through meetings and initiatives to periodically review and revise the mission and curricula of the department, as well as complete the day-to-day operational requirements of the academic programs. The standing committees include the following:

- Awards Committee
- Scholarship Committee
- Forestry Alumni Association
- Graduate Program Committee
- Forest Resources (ex IDP) Program Committee
- Promotion and Tenure Committee
- Safety Committee
- Seminar Committee
- Shortcourse Committee
- Social Committee
- Space Committee
- Technology Committee
- Undergraduate Program Committee
The students have four active organizations that support both social and intellectual activities during their enrollment at Texas A&M University. Faculty members volunteer service time to the needs of these groups, and provide guidance to these organizations. The organizations and their faculty advisors are listed below.

- Xi Sigma Pi – Dr. Carol Loopstra
- Forestry Club – Dr. Mark Tjoelker
- Student Chapter of the Society of American Foresters – Dr. Michael Messina
- Texas Aggie Chapter of the Student Society of Arboriculture – Dr. Todd Watson

**Department Faculty**

Appointment to the faculty of the Department requires a doctorate degree in a discipline associated with the area of expertise as defined by the position description applicable to each position, and approval by the faculty and administration. All current academic faculty members have been awarded their doctoral degrees. The policies for academic freedom, ethics, responsibility, tenure, and promotion at Texas A&M University apply to all faculty equally. Details of the current policies for employment, tenure, and promotion under *Section 12.01.99.M2 University Statement on Academic Freedom, Responsibility, Tenure, and Promotion* dated 27 July 2001 and *System policy 07.01 Ethics Policy, TAMUS Employees* revised 30 November 2000 completes the description of the faculty responsibilities.

The Department benefits from collaborative relationships across the Texas A&M University System, from individuals and agencies in local, state and federal government, as well as from non-government organization (NGO), industry and the private sectors. Several joint appointments have been developed with the Texas Forest Service to underpin teaching, research, service, and extension programs of our faculty. Faculty in the Departments of Entomology and Plant Pathology and Microbiology contribute to our teaching requirements, and are essential to strategic planning for our Department programs.

The Department currently has a total of 16.66 FTE faculty positions, with 5.85 in teaching, 6.73 in research, and 4.08 in extension/outreach. Faculty expertise can be generally described by six major areas, including: spatial and information sciences, forest genetics and biotechnology, sustainable forest ecology and management, forest resource decision sciences, forest products and services, and urban and community forestry (Table IV-1). The Department is fortunate to have the support of six adjunct faculty representing academic, governmental, and private sectors of the forestry community.

The Department of Forest Science provides one the most advanced educational opportunities available for developing leaders in the management, conservation, and restoration of the world's diverse forests. Students seeking to study forestry in this department are interested in solving problems related to protecting forest biodiversity, providing wood, water, recreation, and wildlife for a growing society, and contributing to the advancement of knowledge about forests. Resolving today's forest management issues requires a broad education in the biological,
physical, and social sciences, a solid understanding of the methods used to integrate information from many fields and use it to solve problems, and an in-depth knowledge of the sophisticated tools and techniques that are an essential part of modern forestry. Curricula in the Department of Forest Science incorporate these ideas so that motivated and capable students can become competent forest and resource management professionals and scientists. To this end, the primary focus of our faculty is curriculum design, development, review, and implementation. The faculty as one makes the decisions regarding curriculum, making it collectively, philosophically and strategically their curriculum.

Administrative Support

The Department of Forest Science programs are supported by 7.5 FTE administrative staff. Administrative staff are allocated to College (2.5 FTE), Experiment Station (2.7 FTE) and Cooperative Extension (2.3 FTE) responsibilities. In addition, 11.5 FTE research technical staff are supported by general revenue, external grants, contracts and sales. There is adequate staff in support personnel to accomplish the missions as developed and implemented by the Department.

We experience negligible turnover in administrative and research support staff positions. We endeavor to maintain high standards, positions classified at levels required to support our department and have been successful in attracting and retaining qualified staff.

Program Planning and Outcomes Assessment

The department reviews, revises, and publishes its vision and mission statements on an annual basis, as appropriate. Additionally, there is a “Statement of Capabilities” for the department that is reviewed frequently, on an as-needed basis.

An assessment of our program via a survey for past graduates and forestry employers has been conducted on an annual basis as part of a Southern Association of Schools and Colleges (SACS) review process.

In addition, external constituents serving the Forest Science Advisory Council including forest landowners, the Texas Forestry Association, forest industry, Texas Forest Service, USDA Forest Service, and key environmental and conservation organizations such as The Nature Conservancy, provide input to curriculum and program needs and changes. The department implements recommendations from those parties into its vision, mission, and curriculum, as appropriate.

Annual reassessment of the curriculum is completed on a semi-annual basis. As we review the catalog contents, changes for the following semester or year are implemented.

Additional assessment procedures specifically related to graduate programs are located in section VII.
III. GRADUATE PROGRAM AND AFFILIATED PROGRAMS

III-1 Introduction

The Department of Forest Science offers graduate students the opportunity to meet their educational goals through a variety of degree programs, graduate certificates, affiliations with interdisciplinary programs, centers, and institutes, and associations with other departments in the University. Students may study and conduct research in diverse areas including forest genetics and biotechnology, sustainable forest ecology and management, forest resource decision sciences, urban and community forestry, forest products and services, and spatial sciences. The addition of several new faculty members in the past four years has greatly expanded the opportunities for graduate students. New certificates have recently been developed to provide students with training in areas with increasing opportunities for employment.

III-2 Objectives

III-2.1 Student Intellectual and Professional Development

1) Research: Develop the student's ability to carry out and complete original research.
2) Scholarship: Provide the educational opportunities necessary for students to become experts in their area of interest.
3) Communications: Provide students the opportunity to strengthen oral and written communication skills.
4) Teaching: Provide the opportunity to develop skills and experience in teaching and teaching methods.
5) Analytical Thinking: Challenge students to be critical and analytical thinkers.
6) Professionalism: Encourage students to become actively involved in professional societies and academic and community service activities.

III-2.2 Graduate Program Development

7) Recruit high quality students with potential for excellence.
8) Increase Ph.D. enrollment
9) Increase numbers and funding levels of graduate assistantships.
10) Improve our recruiting strategy.
11) Expand graduate level course offerings that will be attractive to a broad range of students.

III-3 Forest Science Degrees

We currently offer a Doctor of Philosophy in Forestry degree and Master of Science in Forestry degree with thesis and non-thesis options. Students may also opt for a Master of Natural Resources Development. In addition, we usually have several students pursuing graduate degrees within the intercollegiate programs in Molecular and Environmental Plant Sciences or Genetics.
The Doctor of Philosophy and Master of Science degrees are awarded principally for the demonstration of the ability to conduct significant, original research. The student, in consultation with their Advisory Committee, prepares individualized degree plans with consideration to the student's background, interests and career objectives. The faculty of Forest Science recognizes that a certain body of knowledge and skills is necessary to work professionally in forestry. This body of knowledge is therefore required as a core curriculum to ensure that all students meet common standards and that they have the breadth of education to understand the range of topics covered in forest science. These courses are also important components of our Student Learning Outcomes within the Quality Enhancement Program. The core courses required of all graduate students include the following:

- FRSC 606 – Research Process (2 credits)
- FRSC 620 – Advances and Issues in Forest Science (2 credits)
- Statistics (course recommended by Advisory committee) (3 credits)

Student degree plans are developed by the student and the student's Advisory Committee. The plans must include required core courses and follow the guidelines of the University. The flexibility in our degree requirements allows students to develop individually designed programs to meet the student's professional and academic interests and needs, and to allow them to access many of the excellent graduate courses offered throughout the University. The syllabi for FRSC graduate courses are found in Appendix III-1.

III-3.1 The Doctor of Philosophy Degree

The following is taken from the Department of Forest Science Graduate Student Handbook and explains the requirements, steps, and expectations to obtain a Ph.D. Additional information is available in the Handbook provided in Appendix III-2.

1. Time and Credit Hours Required: The time necessary to obtain the Ph.D. degree is markedly influenced by the student’s preparation, particular research interest and competence in the field selected. At least four years of study beyond the bachelor’s degree are commonly required. A minimum of 96 hours beyond the baccalaureate degree or 64 credit hours beyond the master’s degree is required for the Ph.D. degree. Sometimes the nature of the research or inadequacies of undergraduate preparation may make a longer period necessary.

2. The Advisory Committee: The student’s Advisory Committee consists of the student’s major advisor who serves as chair and three or more members of the Graduate Faculty representing the student's several fields of study. One member of the Committee must be from a department other than Forest Science. The members of the Committee should be chosen with consideration given to the specialized subject areas in forestry and supporting fields in which the student intends to do research.

3. Degree Plan: In the first or second semester, the student will initiate a meeting with the Advisory Committee to discuss goals, background and a specific program of courses, research
and teaching. At that time, the Advisory Committee will make an evaluation of the student’s progress and preparedness and suitability for the selected course of study. Successful evaluation will allow the student to continue under guidance of the Advisory Committee, who will assist the student in the preparation of a degree plan and monitor the student’s progress with scheduled meetings during the student’s period of study.

The student’s proposed degree plan must be submitted to the Office of Graduate Studies within one year of enrollment. The proposed degree plan must be approved by the student’s Advisory Committee, the major advisor, the Department Head and the Office of Graduate Studies.

4. The Research Program: The student should begin planning of the suitable project for dissertation research during the first year of graduate study. An approved formal proposal describing the planned research must be submitted to the Office of Graduate Studies at least one month before preliminary examinations are scheduled.

5. Examinations: The Department of Forest Science and the student’s Advisory Committee may require qualifying, cumulative or other types of examinations at any time. These examinations are in addition to the preliminary and final examinations and are given at the discretion of the Department of Forest Science and the student’s Advisory Committee.

The preliminary examination is required for Ph.D. students in Forestry, and is administered by the Advisory Committee. The earliest this exam can be given is when a student is within the six credit hours of finishing coursework, but it must be given no later than the end of the first semester after completion of coursework. The preliminary examination must have both oral and written components, unless otherwise recommended by the Advisory Committee and approved by the Office of Graduate Studies. This examination is concerned with competence in forestry as well as other areas designated by the Advisory Committee.

Before taking the preliminary examination, the student should devote considerable time to study. The student will be expected to know the principles of forestry and the factual material usually taught in the courses in his or her specialized discipline areas, and should also demonstrate a broader understanding of basic principles and a greater ability to synthesize than is ordinarily required in individual courses. When the student has successfully completed the preliminary written and oral examinations, then he or she is officially admitted to candidacy for the Ph.D. degree.

6. The Ph.D. Dissertation: The major requirement for the Ph.D. degree is the completion of a dissertation that meets the approval of the Advisory Committee and the standards of Texas A&M University. Such approval implies that the candidate’s research makes a significant original contribution to the body of knowledge and understanding in the particular field of forestry, and was carried out and reported in a manner demonstrating the ability of the candidate to independently plan and execute original inquiry. A draft copy of the dissertation must be distributed to each member of the Advisory Committee at least two weeks prior to the final examination.
7. Final Examination: A final comprehensive oral examination conducted by the Advisory Committee is required and must include questions on the dissertation and on forestry and other coursework taken in the program.

8. Publication of Research Results: It is expected that the student's dissertation will generate new information that should be disseminated to other researchers and workers. Students should discuss publication procedures with the major advisor early in the graduate program. Publication expectations depend to some extent on the nature of the graduate student funding.

III-3.2 The Master of Science Degree (Thesis Option)

The M.S. degree (thesis option) in Forestry requires coursework, a thesis and a final examination.

1. Time and Credit Hours Required: The major requirements for the degree are the completion of 32 credit hours and the submission of an acceptable thesis. The 32 hours are usually divided among 23 hours coursework (to include at least 15 hours of graduate courses in forestry or related areas) and 8 hours research. The degree plan is developed by the student's Advisory Committee in consultation with the student.

2. The Advisory Committee: The Advisory Committee consists of a major advisor serving as chair, and two or more other members of the Graduate Faculty, one of whom must be from a department other than Forest Science. Members of the Advisory Committee are chosen with consideration given to the specialized subject areas in forestry and supporting fields.

3. The Degree Plan: The degree plan must be approved by the student's Advisory Committee, the Department Head and the Office of Graduate Studies, within 1 year of enrollment. A registration block will be applied to students who do not have an approved degree plan within 2 semesters.

4. The M.S. Thesis: The student should begin informal planning for a suitable project for thesis research during the first semester of graduate study. A formal proposal describing the research should be submitted to the Office of Graduate Studies for approval at least 14 weeks prior to the close of the semester in which the student expects to graduate. The student's Advisory Committee should be kept informed of research progress, usually through formal presentations, progress reports and submitted publications.

5. The Final Examination: A final comprehensive oral examination conducted by the Advisory Committee is required and will include questions on the thesis and on forestry and the other coursework taken in the program.

6. Publication of Research Results: It is expected that the student's thesis will generate new information of interest to other researchers and workers. Students should discuss publication
procedures with the major advisor early in the graduate program. Publication expectations depend to some extent on the nature of the graduate student funding.

III-3.3 The Master of Science Degree (Non-Thesis Option)

The requirements for the degree are essentially the same as for the thesis option. Instead of the thesis, students are required to do extra coursework and a professional paper. Students must complete a minimum of 36 credit hours, of which 18 credit hours must be in the Department of Forest Science, and a minimum of six credit hours in supporting fields. No hours of FRSC 691 (Research) may be counted toward the non-thesis option Master of Science degree. Students pursuing the non-thesis option will enroll in three hours FRSC 685 (Problems) to write the professional paper.

III-4 The Master of Natural Resources Development Degree

The Master of Natural Resources Development (NRD) is a college level degree. Faculty within the Department of Forest Science can supervise students pursuing this degree. The degree is not intended to be a research degree. It is designed for students who want professional graduate training in management of agricultural, food and/or natural resources. The program emphasizes the problem-solving skills necessary to use science and technology to the benefit of humanity. The Master of NRD degree requires a minimum of 36 credit hours, including approximately 12 credit hours of course work taken outside of the student's degree option. Students must prepare a professional paper that focuses on problem solving and must satisfactorily complete a comprehensive final examination.

III-5 Forest Science Graduate Certificates

The Department of Forest Science offers graduate certificates in Geographic Information Systems, Remote Sensing and Tree Improvement. Certificate programs offer a related set of courses needed for proficiency within a subject area and require between 12 and 16 credit hours. Such certificates require the same approvals as new courses. The requirements for the certificates can be found in Appendix III-3.

III-5.1 and III-5.2 Graduate Certificates in Geographic Information Systems and Remote Sensing

GIS and Remote Sensing technologies are applied to wide-ranging fields in spatially distributed information such as transportation, environmental/resource management, marketing, facility management, healthcare delivery, agriculture, planning homeland security, and intelligence. In addition, the synergistic linkages between RS technologies and Geographic Information Systems (GIS) are rapidly increasing. The demand for individuals in these fields is growing rapidly. The certificate programs have been designed to meet this growing demand for qualified individuals. The certificates are administered jointly through the Departments of Forest Science and Geography.
III-5.3 Graduate Certificate in Tree Improvement

The certificate program in Tree Improvement targets practicing tree improvement professionals who want to make a more significant contribution to the scientific management of tree breeding programs. Students may later decide to pursue a graduate degree, and can apply the credits earned in the Certificate Program to that degree. Students enrolled for a graduate degree may also earn the Certificate. The Certificate is structured around four courses and a field practicum. The courses will emphasize applied tree improvement techniques, the principles of forest genetics, tree structure and physiology, and developments in biotechnology applied to tree improvement. These four courses are offered with a web-based distance-learning format and have a short field practicum as a capstone. The certificate is designed to be completed in two years.

III-6 Intercollegiate Programs

Faculty members in the Department of Forest Science are also active in intercollegiate faculties and advise graduate students from those programs. The Intercollegiate faculties bring together faculty from multiple colleges and departments with shared interests. Students obtaining degrees in Molecular and Environmental Plant Sciences (MEPS) and Genetics (GENE) who are advised by Forest Science faculty members, are considered members of the Forest Science Department. The Intercollegiate Program determines the degree requirements.

III-6.1 Molecular and Environmental Plant Sciences (MEPS)

The Intercollegiate Faculty of Molecular and Environmental Plant Sciences offers graduate degrees with emphases in Plant Physiology, Plant Molecular Biology, Plant Biotechnology and Plant Genomics (http://soilcrop.tamu.edu/meps/). The Program currently consists of 49 faculty members and 34 graduate students representing eight departments from the College of Science, and the College of Agriculture and Life Sciences. Members of the MEPS Faculty may also have associations in other intercollegiate and interdisciplinary groups such as the Faculty of Genetics (FOG), the Institute of Food Science and Engineering (IFSE), the Institute of Developmental and Molecular Biology (IDMB), and the Institute for Plant Genomics and Biotechnology (IPGB). The MEPS Faculty promotes the unification of the plant sciences at Texas A&M University through support of the department-based intellectual environment in the plant science disciplines at Texas A&M University. The Faculty provides a forum for interdisciplinary effort to develop programs of excellence in research and graduate education.

MEPS is a graduate degree-granting program, offering Ph.D. and M.S. degrees. The M.S. is Thesis-based. Incoming graduate students are supported through MEPS Fellowships, Merit and/or Regents' Fellowships, or by individual faculty members. Graduate students complete three to four laboratory rotations in the first year before choosing a permanent faculty advisor. Graduate students must satisfy degree requirements established by the program, but are
considered also to be members of the Department of their primary advisor. MEPS awards travel grants of $500 to allow students present their work at scientific meetings around the country. It supports a seminar series featuring outstanding speakers, who represent all areas of plant physiology, plant molecular biology and genetics.

MEPS and Genetics (described below) are able to function on a volunteer basis because the programs attract high quality graduate students and because teaching credits and student credits for both undergraduate and graduate MEPS and GENE courses are awarded to the instructor's home department. In addition, MEPS and GENE courses attract students from outside an instructor's home department. Most MEPS and GENE graduate students have committee members from several departments, which fosters collegiality among faculty members.

Currently, four faculty members of the Forest Science Department are members of the MEPS Faculty. These include Carol Loopstra, Jean Gould, Mark Tjoelker and Mike Messina. Forest Science faculty teach courses and fulfill service responsibilities essential to the MEPS program. For example, Carol Loopstra teaches Biotechnology in Crop Improvement MEPS/GENE 411; and Jean Gould teaches Plant Cell Culture in Crop Improvement MEPS/FRSC 650, and is Chair of the MEPS Admissions Committee.

III-6.2 Genetics

Graduate degrees in Genetics at Texas A&M University are awarded through the Intercollegiate Faculty of Genetics (FOG) (http://www.tamu.edu/genetics/). The program represents 19 departments from the Colleges of Science, Agriculture and Life Sciences, Veterinary Medicine, and the Health Science Center (College of Medicine and the Institute of Biotechnology), and presently consists of 88 faculty that includes a member of the National Academy of Science.

Genetics is an undergraduate and graduate degree-granting program. Incoming graduate students are supported by Teaching Assistant positions for the undergraduate genetics labs, and by Regents' Fellowships. Graduate students complete three to four laboratory rotations in the first year before choosing a permanent faculty advisor. Graduate students must satisfy degree requirements established by the program, but are considered also to be members of the Department of their primary advisor. The FOG offers a Ph.D. degree and two M.S. degree options: Thesis and non-Thesis options.

The FOG awards travel grants of $500 to provide students the opportunity to present their work at scientific meetings around the country. It also supports a seminar series featuring outstanding speakers, from the U.S. and around the world, who represent all areas of genetics.

Currently, three faculty members of the Forest Science Department are members of the Faculty of Genetics. These include Carol Loopstra, David Stelly and Jean Gould. All three have been advisors of GENE graduate students and members of GENE student committees.
III-7 Laboratories, Centers and Institutes

Departmental affiliations with The Spatial Sciences Laboratory, The Institute for Plant Genomics and Biotechnology (IPGB), The Institute of Renewable Natural Resources and The Texas Water Resources Institute are valuable for graduate student training opportunities. They allow students to interact with students, faculty, and staff from other departments and colleges and to obtain a broader range of experiences during their degree programs. In some cases, these affiliations make it possible for our students to use state-of-the-art equipment for their training and research.

III-7.1 The Spatial Sciences Laboratory

The Spatial Sciences Laboratory is a facility of the Texas Agricultural Experiment Station, an agency of the state of Texas, and a part of the Department of Forest Science in the College of Agriculture and Life Sciences at Texas A&M University. The SSL is extensively involved in teaching, research, and service in all three components of the Spatial Sciences, namely, Geographic Information Systems, Remote Sensing, and Global Positioning Systems. The SSL offers masters and doctoral programs through the Department of Forest Science and the Department of Biological and Agricultural Engineering for students who are interested in seeking degrees that either specialize in a specific aspect of GIS or who want to use it as a tool for research in their specific fields. Continuing Education programs are also offered through the SSL that center around providing short term training to enhance the spatial science skills of practicing professionals. SSL interacts closely on both teaching and research programs with other departments, such as the Department of Biological and Agricultural Engineering (BAEN), the Department of Statistics, and the Department of Geography. The following courses taught within the SSL are cross-listed between BAEN and Forest Science:

- FRSC 651/BAEN 651 – Geographic Information Systems
- FRSC 652/BAEN 652 – Advanced Topics in GIS

III-7.2 Institute for Plant Genomics and Biotechnology (IPGB)

The IPGB is housed in the Norman E. Borlaug Center for Southern Crop Improvement, located next door to the Horticulture Forest Science Building. The Borlaug Center houses a faculty member from eight departments with plant scientists (Biochemistry, Biology, Entomology, Forest Science, Horticulture, Plant Pathology and Microbiology, and Soil and Crop Sciences), service labs (Laboratory for Plant Genome Technology and Laboratory for Crop Transformation), and labs for specific crops. In addition, there is considerable shared equipment for use by those housed in the building as well as others at the University. A DNA sequencing service is available. Plant growth facilities include two sets of modern greenhouses, 18 growth chambers, three plant growth rooms, and two potting areas. Users pay for space, but at a reduced rate since some staff are paid by TAES or the University. Much of the equipment available to Forest Science graduate students would not be easily accessible elsewhere. In addition to access to equipment and facilities, our affiliation with the IPGB provides students with access to training on equipment and the opportunity to interact with faculty, staff, and students from other departments working on related research.
Dr. Carol Loopstra and members of her laboratory are housed in the Borlaug Center and almost all the research done by her students is done using IPGB facilities. Dr. Jean Gould and her graduate students are major users of the greenhouses for transgenic plants and also use the shared equipment. Dr. Mark Tjoelker and his graduate students also use the plant growth facilities. Dr. Claire Williams was a major user of the shared equipment before she left the department. We have been given approval to hire two new faculty members in the areas of forest tree genomics and quantitative forest genetics. Presumably, these faculty and their students will also benefit from access to these facilities.

III-7.3 Institute of Renewable Natural Resources

Texas will experience ever-increasing demands on its natural resources as the state’s rapid population and economic growth continue. Often conflicting demands are placed on the state’s natural resources, such as water, timber, forage, mineral, wildlife and aquatic recreation resources, and for enhanced protection of wilderness, scenic and historic areas, natural areas, wildlife, and fisheries. Effective responses to these pressures require scientific information, effective education, and reasonable policies, laws and institutions to guide the allocation, use and protection of natural resources, and the technical competence in on-the-ground uses and management practices.

The Institute of Renewable Natural Resources (IRNR) was established as a component of the College of Agriculture and Life Sciences at Texas A&M University in 1978 to respond to natural resource issues. IRNR's mission was to coordinate and strengthen teaching and research programs among four departments (Forest Science; Rangeland Ecology and Management; Recreation, Parks and Tourism Sciences; and Wildlife and Fisheries Sciences). In establishing the Institute, the integrity of participating departments was maintained in recognition of the importance of the unique role of each discipline. A director was appointed for the Institute and several courses and a curriculum implemented. During the subsequent 17 years, Institute faculty interacted largely in association with the Natural Resources Conservation undergraduate degree option available to undergraduates in all four departments, and the Renewable Resources Extension Act program. In 1995, a new undergraduate degree in Renewable Natural Resources replaced the former option, and is jointly administered by the faculty of all four departments. Although there is no 'Faculty of Renewable Natural Resources' per se, the Institute benefits Forest Science’s doctoral students by facilitating interaction among the faculty in the four IRNR departments thereby broadening the opportunities for course work and research collaboration. The Masters in Natural Resources Development can be considered to serve IRNR students with interests in programs that integrate across all IRNR program dimensions, although technically the degree home is broader in the sense that it is interdepartmental in the College of Agriculture and Life Sciences.
III-7.4 The Texas Water Resources Institute

The Texas Water Resources Institute is located on the main campus of Texas A&M University in College Station, Texas, and is a unit of the Texas Agricultural Experiment Station and Texas Cooperative Extension. It is part of a national network of institutes created by the Water Resources Research Act of 1964. The Institute is funded by the United States Geological Survey and is affiliated with the National Institutes for Water Research.

The Texas Water Resources Institute serves as a focal point for water-related research at Texas universities, encouraging discussion of statewide issues through meetings and multi-university studies. The Institute links academic expertise with state and federal agencies, strengthening water research and education. Additionally, the Institute provides leadership for water resources programs through grant administration, pre-award services, project management, communications and facilitation of interagency collaboration. The WRI offers fellowship opportunities for research.

The SSL currently has several projects with TWRI, totaling about $400K/year. In the past, three graduate students in the SSL, Jennifer Jacobs, Balaji Narasimhan, and Kim Crumpler, have received scholarships and projects ranging from $1000 to $5000 dollars in funding from TWRI. Currently, one graduate student, Bakkialakshmi Palanisamyhas, has a project for $5000 with TWRI. Dr. Srinivasan serves as a faculty member contributing to development of a graduate degree program in Water Science that will provide an academic base for students with projects in TWRI and elsewhere in water related projects across COALS. The SSL is currently exploring opportunities to share graduate students and full time employees with TWRI.

III-7.5 Forest Tree Molecular Cytogenetics Laboratory

Dr. Nurul Islam-Faridi is a new member of Southern Institute of Forest Genetics, USDA-Forest Service, Harrison Experimental Research Station, Mississippi, who is also an Adjunct Associate Professor in the Department of Forest Science, and member of the Graduate Faculty of Texas A&M. His lab is located in the Forest Sciences Laboratory on Agronomy Road. Dr. Islam-Faridi's main research interest is to study the genome structure, organization and evolution of trees - mainly pine, poplar and chestnut using molecular cytogenetic techniques. Recently, he has been awarded a NSF grant to develop a cyto-molecular map in pine and integrate this map to the linkage map. He has also been awarded a DOE grant to study the gene distribution in poplar using bacterial artificial chromosomes. Dr. Islam-Faridi will be collaborating with others in the Department of Forest Science, as opportunities arise.
III-8 Joint Appointments

III-8.1 Agricultural Economics

The Department of Agricultural Economics at Texas A&M University tailors its educational efforts to produce highly skilled applied economists focused on quantitatively-based economic research and analyses of managerial and policy questions. Graduates pursue careers in academia, business, and government service. The Department offers Ph.D. and M.S. programs as well as an MAB, or Masters of Agribusiness, in a joint program between Agricultural Economics and the Texas A&M University Mays Business School. The curricula for these applied economics and agribusiness degrees come mainly from the College of Agriculture and Life Sciences, the Mays Business School and the Department of Economics in the College of Liberal Arts.

Two faculty from the Department of Forest Science hold appointments in the Department of Agricultural Economics. Dr. Diana Burton has served on their graduate faculty for over a decade. She has advised two Agricultural Economics doctoral students and one masters student, supervised a number of doctoral students on grants and contracts and served on students' committees. She regularly works with members of the Agricultural Economics faculty on joint research in market organization, exchange mechanisms and contracts, time series, and resource economics policy issues.

Dr. Jianbang Gan has recently become a member of the Agricultural Economics graduate faculty. He is co-supervising two Agricultural Economics doctoral students and will participate in teaching a graduate-level course in Agricultural Economics. He also conducts joint research with the Agricultural Economics faculty on economic impact assessments of climate change, forest product trade, and other issues pertinent to natural resource economics and management.

Agricultural Economics provides important curricula and faculty expertise for Forest Science graduate students interested in markets, economics and policy. In addition to strong connections with the natural resource economics field, Forest Science graduate students can, and have taken, graduate courses in: market organization and structure, demand analysis, international trade, production economics, agribusiness, finance, time-series, quantitative business analysis, econometrics, development, and agricultural and food policy. Faculty from Agricultural Economics also serve on the committees of Forest Science students interested in forest economics, forest policy, and forest management.

The collaborative educational efforts of graduate students interested in forest resource economics, policy, and management issues have been productive and will continue to provide opportunities to educate students, cooperate on research projects and grants, and produce solid academic results.
III-8.2 Entomology

An affiliation between the Department of Forest Science and the Department of Entomology is important for the training of graduate students as well as undergraduates. The Department of Entomology is one of the top entomology departments in the United States based on its outstanding students, staff and faculty, excellent facilities, and exceptionally diverse programs. Dr. Robert Coulson is Professor of Entomology and Adjunct Professor of Forest Science and has chaired the committees of past and present students pursuing graduate degrees within the Department of Forest Science and has served on the committees of others.

Dr. Coulson’s research has been transdisciplinary in approach and directed primarily to investigations of the activities and impacts of insects in forested landscapes. He currently has funding from the U.S. Forest Service to examine the impact of the southern pine beetle on the ecological processes that affect sustainability of forests. His research addresses issues of significance to ecological science as well as natural resource management. In 1984, he co-founded the Knowledge Engineering Laboratory (KEL) to facilitate research and development on computer applications for planning, problem solving and decision making in environmental science and management. Focus of KEL research is directed to landscape scale problems that require integration, interpretation, and use of different representations of knowledge. Special emphasis has been placed on ways and means of blending qualitative heuristic knowledge of experts, using methodologies from artificial intelligence, with quantitative information that results from scientific investigations.

III-8.3 Plant Pathology and Microbiology

Affiliations with the Department of Plant Pathology and Microbiology are important for the training of graduate and undergraduate students interested in forest health and diseases of forest and urban trees. Dr. David Appel, Professor & Associate Department Head in the Department of Plant Pathology and Microbiology, is an adjunct faculty member in the Department of Forest Science. His research focuses on the etiology, epidemiology, and control of forest and shade tree diseases. Particular attention is being given to the oak wilt epidemic currently ravaging the oak savannas of central Texas. Dr. Appel serves on graduate student advisory committees within the Department and can serve as chair. This affiliation provides students accepted into the Forest Science graduate program an opportunity to specialize in pathology.

III-9 Recruiting

Various approaches are used for recruiting. In many cases, individual faculty members recruit their own students using advertisements in journals, websites of professional organizations, at meetings, or with brochures, such as one produced by the Spacial Sciences Lab. The Department receives numerous inquiries, usually by e-mail. If a request for information comes to the staff advisor or Associate Head for Graduate Programs, information on the prospective student is sent to the appropriate faculty members or the entire faculty depending upon the stated interests. Most students have obtained information on the Department and individual faculty members from the
departmental web site prior to contacting us and know with whom they wish to work. Although we do not track numbers of inquiries, there are certainly more inquiries directed to individual faculty members than to the graduate advisors. Our numerous affiliations with intercollegiate faculties, other departments, and institutes and centers facilitate our recruitment. For example, of the six current MEPS students, three were accepted by MEPS and the students then chose to work in Forest Science labs. The Office of Graduate Studies (OGS) has had a full-time staff member devoted to graduate recruiting.

III-10 Assistantships

All but a few students are given some form of financial assistance (Table III-1). The most common form of support is a research assistantship funded by a grant to the student’s advisor. The department has some teaching assistantships available for qualified students. The $54,667 per year provided for assistantships funds approximately 13 one-semester assistantships (technically titled GANT for Graduate Assistantship Non-Teaching since graduate students in teaching assistant roles are not considered the instructor of record). In addition, there are fellowships available through the department made possible by endowments (Table III-2). Not all fellowships are awarded each year, depending on the amount of interest that has accumulated.

Highly qualified domestic students are eligible for Regent’s or Merit Fellowships and other fellowships offered by the University. Recently, additional fellowship opportunities are increasingly available to promote diversity. Some international students are supported by an employer, or by their government. The value of the assistantship that is offered varies with discipline and source of funding. The values of departmental assistantships during the 2002-2003 fiscal year are given in Table III-3 along with those from other southern forestry departments for comparative purposes. All students on assistantships have traditionally received health insurance identical to that offered to faculty and staff. Starting in Fall 2004, the state contribution for incoming graduate students will be reduced. Students on assistantships receive out-of-state tuition waivers as long as they register for at least nine credits fall and spring semesters and six credits in the summer.

The University provides out-of-state tuition waivers, but does not provide full tuition waivers. Tuition and fees for some students are covered by the grants they are working on. In recent years, the department has been given funds to use for tuition remissions. Students who pay their own tuition have been awarded up to $500 towards tuition at least once and frequently twice per year. Ph.D. students entering with a Masters degree are limited by a 99-hour cap. Once a student accumulates 100 capital credits, they must pay out-of-state tuition regardless of their state of residency. Therefore, students must finish within four years or be financially penalized.
Table III-1. Fall 2004 Graduate Students, Major, Degree, Advisor and Source of Support.

<table>
<thead>
<tr>
<th>Name</th>
<th>Major</th>
<th>Degree</th>
<th>Advisor</th>
<th>Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bernard, Dudley</td>
<td>FORS</td>
<td>Ph.D.</td>
<td>Watson</td>
<td>Grant</td>
</tr>
<tr>
<td>Chmura, Daniel</td>
<td>FORS</td>
<td>Ph.D.</td>
<td>Tjoelker</td>
<td>Fulbright</td>
</tr>
<tr>
<td>Hass, Amir</td>
<td>FORS</td>
<td>Ph.D.</td>
<td>Messina</td>
<td>Grant</td>
</tr>
<tr>
<td>Oguiz, Hakan</td>
<td>FORS</td>
<td>Ph.D.</td>
<td>Srinivasan</td>
<td>Sponsored</td>
</tr>
<tr>
<td>Martinez-Trinidad, Tomas</td>
<td>FORS</td>
<td>Ph.D.</td>
<td>Watson</td>
<td>Sponsored</td>
</tr>
<tr>
<td>Ramaswamy, Sivakumar</td>
<td>FORS</td>
<td>Ph.D.</td>
<td>Srinivasan</td>
<td>Grant</td>
</tr>
<tr>
<td>Zhang, Xuesong</td>
<td>FORS</td>
<td>Ph.D.</td>
<td>Srinivasan</td>
<td>Grant</td>
</tr>
<tr>
<td>Zhao, Kaiguang</td>
<td>FORS</td>
<td>Ph.D.</td>
<td>Popescu</td>
<td>Grant</td>
</tr>
<tr>
<td>Arnold, Marianne</td>
<td>MEPS</td>
<td>Ph.D.</td>
<td>Gould</td>
<td>Grant</td>
</tr>
<tr>
<td>Yang, Suk-Hwan</td>
<td>MEPS</td>
<td>Ph.D.</td>
<td>Loopstra</td>
<td>Grant</td>
</tr>
<tr>
<td>Petty, Saul</td>
<td>FORS</td>
<td>M.S.</td>
<td>Coulson</td>
<td>Grant</td>
</tr>
<tr>
<td>McKay, Benjamin</td>
<td>FORS</td>
<td>M.S.</td>
<td>Messina</td>
<td>Self</td>
</tr>
<tr>
<td>Crumpler, Kim</td>
<td>FORS</td>
<td>M.S.</td>
<td>Srinivasan</td>
<td>Grant</td>
</tr>
<tr>
<td>Graves, Elizabeth</td>
<td>FORS</td>
<td>M.S.</td>
<td>Srinivasan</td>
<td>Grant</td>
</tr>
<tr>
<td>Michalak, Greg</td>
<td>FORS</td>
<td>M.S.</td>
<td>Srinivasan</td>
<td>Grant</td>
</tr>
<tr>
<td>Mutlu, Muge</td>
<td>FORS</td>
<td>M.S.</td>
<td>Popescu</td>
<td>Grant</td>
</tr>
<tr>
<td>Book, Russell</td>
<td>FORS</td>
<td>M.S.</td>
<td>Watson</td>
<td>Fellowship</td>
</tr>
<tr>
<td>Stover, Corey</td>
<td>FORS</td>
<td>M.S.</td>
<td>Tjoelker</td>
<td>Grant</td>
</tr>
<tr>
<td>Young, De'Ettra</td>
<td>FORS</td>
<td>M.S.</td>
<td>Srinivasan</td>
<td>Grant</td>
</tr>
<tr>
<td>Sathyan, Pratheesh</td>
<td>MEPS</td>
<td>M.S.</td>
<td>Loopstra</td>
<td>Grant</td>
</tr>
<tr>
<td>Wang, Hongyun</td>
<td>MEPS</td>
<td>M.S.</td>
<td>Loopstra</td>
<td>Grant</td>
</tr>
<tr>
<td>Branton, Eric</td>
<td>FORS</td>
<td>M. of Ag.</td>
<td>Smith</td>
<td>Fellowship</td>
</tr>
<tr>
<td>Harrier, Gareth</td>
<td>FORS</td>
<td>M. of Ag.</td>
<td>Watson</td>
<td>Self</td>
</tr>
<tr>
<td>O'Fiel, Martha</td>
<td>FORS</td>
<td>M. of Ag.</td>
<td>Watson</td>
<td>Self</td>
</tr>
</tbody>
</table>

Table III-2. Endowments to the Department of Forest Science used for graduate programs.

<table>
<thead>
<tr>
<th>Source</th>
<th>Current Principle</th>
</tr>
</thead>
<tbody>
<tr>
<td>JM Carder Endowment for Excellence in Urban Forestry</td>
<td>$250,000.00</td>
</tr>
<tr>
<td>TAMU/UVG International Program</td>
<td>$18,000.00</td>
</tr>
<tr>
<td>Dishman Endowment for Forest Science Graduate Fellowships</td>
<td>$97,378.95</td>
</tr>
<tr>
<td>Phillip B. Lucas Endowment for Forest Science Graduate Fellowships</td>
<td>$97,871.04</td>
</tr>
<tr>
<td>McMillan-Ward Memorial Endowment for Graduate Fellowships</td>
<td>$200,000.00</td>
</tr>
<tr>
<td>McMillan-Ward Memorial Graduate Fellowship Endowment</td>
<td>$200,000.00</td>
</tr>
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</table>
Table III-3. FY 2003-2004 Assistantship Levels from a Southern NAPFSC survey.

<table>
<thead>
<tr>
<th>University</th>
<th>FTE</th>
<th>Masters</th>
<th>PhD</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alabama A&amp;M</td>
<td>1/2 time</td>
<td>$12,000</td>
<td>$18,000</td>
<td>In-state</td>
</tr>
<tr>
<td>Alabama A&amp;M</td>
<td>1/2 time</td>
<td>$15,600</td>
<td>$21,600</td>
<td>out-of-state</td>
</tr>
<tr>
<td>Auburn University</td>
<td>1/3 time</td>
<td>$14,200</td>
<td>$16,600</td>
<td></td>
</tr>
<tr>
<td>Clemson</td>
<td>1/4 time</td>
<td>$5,500</td>
<td>$6,500</td>
<td></td>
</tr>
<tr>
<td>Clemson</td>
<td>1/2 time</td>
<td>$11,000</td>
<td>$13,000</td>
<td></td>
</tr>
<tr>
<td>LA State</td>
<td>1/4 time</td>
<td>$7,000</td>
<td>$8,000</td>
<td></td>
</tr>
<tr>
<td>LA State</td>
<td>1/2 time</td>
<td>$14,000</td>
<td>$16,000</td>
<td></td>
</tr>
<tr>
<td>LA Tech</td>
<td>no response</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MS State</td>
<td>FO 1/2 time</td>
<td>$12,000</td>
<td>$15,000</td>
<td></td>
</tr>
<tr>
<td>MS State</td>
<td>FP 1/2 time</td>
<td>$12,560</td>
<td>$15,000</td>
<td></td>
</tr>
<tr>
<td>NC State</td>
<td>1/2 time</td>
<td>$13,000</td>
<td>$15,000</td>
<td></td>
</tr>
<tr>
<td>OK University</td>
<td>1/2 time</td>
<td>$11,520</td>
<td>$13,422</td>
<td></td>
</tr>
<tr>
<td>SFA State Univ</td>
<td>1/2 time</td>
<td>$11,250</td>
<td>$16,000</td>
<td></td>
</tr>
<tr>
<td>Southern University</td>
<td>1/2 time</td>
<td>$12,000</td>
<td>n/a</td>
<td></td>
</tr>
<tr>
<td>TAMU</td>
<td>1/2 time</td>
<td>$12,936</td>
<td>$14,400</td>
<td></td>
</tr>
<tr>
<td>University of KY</td>
<td>1/2 time</td>
<td>$15,000</td>
<td>n/a</td>
<td></td>
</tr>
<tr>
<td>University of Ark</td>
<td>1/2 time</td>
<td>$12,500</td>
<td>$15,000</td>
<td></td>
</tr>
<tr>
<td>University of FLA</td>
<td>1/4 time</td>
<td>$6,000</td>
<td>$15,000</td>
<td></td>
</tr>
<tr>
<td>University of FLA</td>
<td>1/3 time</td>
<td>$12,724</td>
<td>$14,564</td>
<td></td>
</tr>
<tr>
<td>University of FLA</td>
<td>1/2 time</td>
<td>$13,770</td>
<td>$15,683</td>
<td></td>
</tr>
<tr>
<td>University of GA</td>
<td>1/4 time</td>
<td>$9,281</td>
<td>$10,031</td>
<td></td>
</tr>
<tr>
<td>University of GA</td>
<td>1/3 time</td>
<td>$12,375</td>
<td>$13,375</td>
<td></td>
</tr>
<tr>
<td>University of GA</td>
<td>1/2 time</td>
<td>$18,563</td>
<td>$20,063</td>
<td></td>
</tr>
<tr>
<td>University of TN</td>
<td>1/2 time</td>
<td>$12,000</td>
<td>$15,000</td>
<td></td>
</tr>
<tr>
<td>VA Tech</td>
<td>1/2 time</td>
<td>$15,600</td>
<td>$16,560</td>
<td></td>
</tr>
<tr>
<td>Average</td>
<td>1/2 time</td>
<td>$13,218</td>
<td>$15,982</td>
<td></td>
</tr>
</tbody>
</table>

III-11 Current Students

Forest Science is one of the smaller departments within the College of Agriculture and Life Sciences. As of spring 2004, the Department has 24 graduate students including six students pursuing degrees in Molecular and Environmental Plant Sciences and two non-degree seeking students. Table III-4 gives the breakdown of current students by degree, major, sex and ethnicity. The average incoming GRE score was 1126 (V+Q). The average incoming grade point ratio was 3.5. The average current grade point ratio for these students is 3.64.
Table III-4. Enrollment Statistics - Fall 2004 Graduate Students.

<table>
<thead>
<tr>
<th>Degree</th>
<th>African American</th>
<th>Domestic White</th>
<th>International</th>
<th>Total</th>
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<tbody>
<tr>
<td></td>
<td>Female</td>
<td>Male</td>
<td>Female</td>
<td>Male</td>
</tr>
<tr>
<td>PHD-FORS</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PHD-MEPS</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>MS-FORS</td>
<td>1</td>
<td>2</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>MS-MEPS</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MS of AG</td>
<td></td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>7</td>
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</tbody>
</table>

### III-12 Graduate Students 1998-2004

The number of students has fluctuated over recent years with a drop following the loss of several faculty members in the mid to late 1990s. The numbers of graduate students since 1998 are shown in Table III-5. Between May 1998 and December 2003, 21 students in the Department of Forest Science received Ph.D. degrees, 15 received MS degrees, and 2 received Master of Agriculture degrees. Table III-6 lists our graduates with their last known position and the number of publications resulting from their thesis or dissertation. Table III-7 contains a list of thesis and dissertation titles.
Table III-5. Enrollment Statistics - Number of graduate students by year, degree, and nationality.

<table>
<thead>
<tr>
<th>Year</th>
<th>Domestic</th>
<th></th>
<th>International</th>
<th></th>
<th>Total</th>
</tr>
</thead>
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<tr>
<td></td>
<td>Female</td>
<td>Male</td>
<td>Female</td>
<td>Male</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>1998</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PHD</td>
<td>4</td>
<td>5</td>
<td>2</td>
<td></td>
<td>10</td>
</tr>
<tr>
<td>MS/Mag</td>
<td>6</td>
<td>6</td>
<td>0</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>10</td>
<td>11</td>
<td>2</td>
<td></td>
<td>12</td>
</tr>
<tr>
<td>1999</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PHD</td>
<td>5</td>
<td>2</td>
<td>2</td>
<td></td>
<td>10</td>
</tr>
<tr>
<td>MS/Mag</td>
<td>5</td>
<td>3</td>
<td>0</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>10</td>
<td>5</td>
<td>2</td>
<td></td>
<td>12</td>
</tr>
<tr>
<td>2000</td>
<td></td>
<td></td>
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<tr>
<td>PHD</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td></td>
<td>12</td>
</tr>
<tr>
<td>MS/Mag</td>
<td>5</td>
<td>2</td>
<td>0</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>9</td>
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<td>14</td>
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<tr>
<td>2001</td>
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</tr>
<tr>
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<td>1</td>
<td>0</td>
<td></td>
<td>12</td>
</tr>
<tr>
<td>MS/Mag</td>
<td>2</td>
<td>3</td>
<td>0</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
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<td>12</td>
</tr>
<tr>
<td>2002</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PHD</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td></td>
<td>9</td>
</tr>
<tr>
<td>MS/Mag</td>
<td>3</td>
<td>7</td>
<td>0</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>6</td>
<td>8</td>
<td>1</td>
<td></td>
<td>11</td>
</tr>
<tr>
<td>2003</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PHD</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td></td>
<td>9</td>
</tr>
<tr>
<td>MS/Mag</td>
<td>3</td>
<td>7</td>
<td>0</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Non-degree seeking</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>6</td>
<td>8</td>
<td>1</td>
<td></td>
<td>11</td>
</tr>
<tr>
<td>2004</td>
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</tr>
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<td>1</td>
<td>1</td>
<td>1</td>
<td></td>
<td>10</td>
</tr>
<tr>
<td>MS/Mag</td>
<td>4</td>
<td>6</td>
<td>1</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Non-degree seeking</td>
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<td>1</td>
<td>1</td>
<td></td>
<td>1</td>
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<td>Total</td>
<td>5</td>
<td>8</td>
<td>2</td>
<td></td>
<td>13</td>
</tr>
<tr>
<td>Name</td>
<td>Graduation</td>
<td>Degree</td>
<td>Refereed</td>
<td>Non-Refereed</td>
<td>Employment (title and employer)</td>
</tr>
<tr>
<td>---------------------</td>
<td>------------</td>
<td>--------</td>
<td>----------</td>
<td>--------------</td>
<td>----------------------------------------------------------------------</td>
</tr>
<tr>
<td>Taylor, Eric</td>
<td>May-98</td>
<td>Ph.D.</td>
<td>1</td>
<td>17</td>
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</tr>
<tr>
<td>Meyer, Thomas</td>
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<td>Ph.D.</td>
<td>0</td>
<td>6</td>
<td>Associate Professor, Univ. of Conn.</td>
</tr>
<tr>
<td>Wang, Weizhong</td>
<td>Dec-98</td>
<td>Ph.D.</td>
<td>0</td>
<td>1 poster</td>
<td>Nokia</td>
</tr>
<tr>
<td>No, Eun-Gyu, Ph.D.</td>
<td>May-99</td>
<td>Ph.D.</td>
<td>3</td>
<td>1</td>
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</tr>
<tr>
<td>Mei, Beijian</td>
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<td>1</td>
<td>0</td>
<td>Research Fellow, S. China Botanical Garden, Chinese Acad. of Sci.</td>
</tr>
<tr>
<td>Ratnayaka, Indira</td>
<td>Dec-99</td>
<td>Ph.D.</td>
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<td>5</td>
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</tr>
<tr>
<td>Elsk, Chris, Ph.D.</td>
<td>May-00</td>
<td>Ph.D.</td>
<td>5</td>
<td></td>
<td>Assistant Professor, TAMU</td>
</tr>
<tr>
<td>Villalon, Debra, Ph.D.</td>
<td>May-00</td>
<td>Ph.D.</td>
<td>2</td>
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<td>International Paper</td>
</tr>
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<td>Wang, Hongyan</td>
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<td>Ph.D.</td>
<td>1</td>
<td>1</td>
<td>Post-Doc, U. Massachusetts</td>
</tr>
<tr>
<td>Wongcharupan, Metha</td>
<td>May-00</td>
<td>Ph.D.</td>
<td>1</td>
<td>0</td>
<td>Forest Economist (Visiting Scientist), USFS</td>
</tr>
<tr>
<td>Byram, Thomas</td>
<td>Dec-00</td>
<td>Ph.D.</td>
<td>0</td>
<td>0</td>
<td>Director, Western Gulf Tree Improvement Program</td>
</tr>
<tr>
<td>Wang, Jau-Tay</td>
<td>May-01</td>
<td>Ph.D.</td>
<td>2</td>
<td>1</td>
<td>Asst. Prof. Bioinformatics, Hsin-Kuo University, Tainan, Taiwan</td>
</tr>
<tr>
<td>Asinus, Emmmanuel</td>
<td>Dec-01</td>
<td>Ph.D.</td>
<td></td>
<td></td>
<td>Unknown</td>
</tr>
<tr>
<td>Kennedy, Elizabeth</td>
<td>May-02</td>
<td>Ph.D.</td>
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III-13 Administrative organization

III-13.1 Graduate Program Committee (GPC)

Within the Department of Forest Science, the graduate program is administered by a Graduate Program Committee (GPC) composed of five faculty members and a staff advisor (Ms. Jennifer L. Kramer). The Associate Head for Graduate Programs chairs the committee and has the signing authority for documents going to the Office of Admissions or the Office of Graduate Studies (OGS). The Department Head appoints the Associate Head for Graduate Programs. The GPC is charged with a variety of roles as discussed below. The staff advisor is instrumental in supporting the various activities of the GPC and works closely with the chair.

Admissions – With the exception of letters of reference, application materials are sent by prospective students to the Department of Admissions. Non-electronic documents are scanned and posted to the OARDOCS system for accession by the department. The departmental graduate advisor compiles a file for review. If an advisor was not previously identified, appropriate faculty are contacted to determine if they are interested in advising the applicant. We do not accept an applicant if an advisor is not available. The GPC chair reviews the file for completeness and irregularities. Other members of the GPC then review the file and make their recommendations regarding admission. The chair considers all comments and recommendations before submitting an acceptance decision.

New courses or certificates – Faculty proposing a new course, changes to a course or a certificate work with the staff advisor and departmental business administrator to assemble the paperwork required. The GPC then reviews the documentation and makes a recommendation to the faculty. If approved, the request passes through the following approval steps:

- Department (Head or Associate Head signs)
- COALS Graduate Instruction Committee (GIC) (Chair signs)
- COALS Graduate Operations Committee (GOC) Dean (Associate Dean signs)
- Graduate Council (Dean of Graduate Study signs)
- Faculty Senate
- President
- Texas Higher Education Coordinating Board

Review and Revision of the Curriculum – As needed, the graduate curriculum is reviewed by the GPC and recommendations for revisions are made. All revisions are discussed at a faculty meeting or retreat and voted on by the faculty. The last review was held in 2001.

Graduate student awards and tuition remission – Each year, an outstanding Ph.D. student and an outstanding Masters student are selected by the GPC. These students are recognized at the annual banquet for their research productivity (presentations at meetings and publications), teaching, and service. Occasionally, we are given tuition remission funds to award. The GPC determines how funds are distributed to students applying for the funds.

Nomination of Faculty to the University Graduate Faculty – Members of graduate student advisory committees must be members of the University Graduate Faculty. Most faculty
members can obtain admission without approval of the COALS GIC. However, certain classes of faculty including adjunct faculty, need approval by the COALS GIC and the University Graduate Council.

III-13.2 Staff Advisor

The staff advisor is critical to the graduate program. This position is shared with the undergraduate program. In addition to the roles described above, she is a primary contact and source of information for applicants. She communicates with possible students with information on the department and application procedures. She also helps new and established graduate students. She is familiar with procedures for registration, scheduling of oral exams, submission of degree plans and proposals, etc. and helps the graduate students with these steps in their degree programs.

III-13.3 College of Agriculture and Life Sciences Graduate Instruction Committee

The Associate Head for Graduate Programs serves as the departmental representative on the college-level graduate instruction and programs committee. As described above, this committee approves new courses, substantial changes in courses, new degree programs and certificates, and nominations to the graduate faculty. In addition, they have an advisory role to the Dean’s office or University Graduate Council on matters relating to graduate education. Meetings of the committee are also a source of information to the department regarding issues in graduate education.

III-13.4 Office of Graduate Admissions

As described above, applications are sent to the Office of Admissions. In the past two years, the Office has switched to an electronic system whereby authorized representatives of the department can obtain applications from the OARDOCS system. The Office of Admissions receives official transcripts and scores, calculates grade point ratios, and determines if applications are complete. This service is especially useful for applications coming from outside the United States. Once the departmental GPC makes a decision to accept or reject an applicant, the Office of Admissions is notified and they contact the student, supplying additional information as appropriate.

III-13.5 Office of Graduate Studies

The Office of Graduate Studies (OGS, http://ogs.tamu.edu/OGS/OGSAdmin.htm) maintains the official record for each graduate student, and in this role, serves as the primary administrative body and overarching source of information for graduate education. Once a graduate student has been accepted by an academic department or college, the OGS assists and facilitates progression towards completion of a graduate degree through maintenance of all official documents. Clearance for graduation, including final review of Theses and Dissertations when required, is performed by OGS. The Thesis Office is available to help students through the process of preparing and submitting their thesis, dissertation or record of study in accordance with Texas A&M University standards. The Dean of Graduate Studies and the OGS, have been powerful.
advocates for graduate students, and have fought to ensure student benefits. In addition, OGS offers workshops for graduate student on subjects of interest such as "Preparing for the Job Market."

III-14 Graduate Program Summary

One of the greatest strengths of the Department of Forest Science Graduate Program is the great diversity in faculty and areas of research. Students have the options for study in traditional areas of forestry research such as silviculture, remote sensing, economics and wood technology, or in newer areas related to forest ecosystem or other natural resource sciences such as GIS and biotechnology. This diversity also allows students to develop research projects spanning very different areas. For example, a recent graduate developed a research project that combined genetics and GIS. Students interested in eco-physiology and global climate change can investigate physiological responses at whole-plant and molecular levels. There is also a great deal of flexibility in the program. Students can choose from several degree options and within each of these, can design a program of courses that best meets their needs. The quality of the program is reflected in the positions our graduates find in the highly competitive academic and industrial job markets (Table III-6).

The graduate program is relatively small. This has its advantages and disadvantages. The ratio of graduate students to faculty is very good, and students benefit from the corresponding relationships with their advisor and advisory committee. On the other hand, greater student numbers would increase the critical mass within a sub-discipline thereby facilitating group discussions and analytical and critical thinking. The greatest obstacle to increasing student numbers at this time is funding for student fellowships or assistantships, research, and program support.
IV. FACULTY

IV-1 Current Faculty

The Department of Forest Science currently has twelve full-time and one part-time faculty positions, three vacancies (genomics, quantitative genetics, and wood products), and has permission to hire a hydrologist in partnership with the Department of Biological and Agricultural Engineering. Ten emeritus faculty contribute in various ways to the program. The Department has numerous joint faculty appointments, including appointments the following Departments – Entomology, Plant Pathology and Microbiology, Soil and Crop Sciences, Agricultural Economics, and Biological and Agricultural Engineering. There are several faculty members that also serve on other faculties including Genetics faculty, Microbiology and Environmental Plant Science faculty and with the Institute of Renewable Natural Resources. Additionally there are three full-time Extension faculty and seven adjunct faculty that support the Department’s programs.

The Department is relatively well balanced with respect to professorial rank, with three full Professors, five Associate Professors, and five Assistant Professors, one Assistant Lecturer, and one Visiting Assistant Professor, as of May 2004. Full-time faculty members are on twelve-month appointments, and the one part-time position is filled with an Assistant Lecturer with a 66% appointment.

The faculty can be characterized as unique and diverse, with training and experience that contribute to program excellence, and create an outstanding base of knowledge to underpin undergraduate and graduate programs. The diversity of faculty backgrounds has been described in this report in two ways, including a matrix of research expertise (Table IV-1), and a summary of Forest Science faculty background (Table IV-2). Collectively, the teaching faculty has 109.5 years experience at TAMU, 92.5 years at other academic institutions, and approximately 80.5 years of experience in industrial and/or commercial organizations. Faculty at the rank of Assistant Professor, Associate Professor, and Professor hold Ph.D. degrees obtained from ten different institutions of higher education (Table IV-2). Individual faculty vitae are attached (Appendix IV-1).

IV-2 Recent Changes in Faculty Composition

During the last four years, seven new full-time teaching-research faculty members, one part-time assistant lecturer and two Extension faculty members have joined the Department of Forest Science, thereby greatly elevating its academic diversity. Of the new teaching-research faculty, two appointments were at the Associate Professor level, and five at the level of Assistant Professor. These new appointments were the result of a combination of factors including the retirement of faculty, the reorganization and re-evaluation of the mission and goals of the Department of Forest Science, and are symbolic of the degree of support for the Forest Science program by the Ag Program administration.
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1 Dates following name indicate hiring date, promotion to current position date
SIP10 - 12 month faculty salary paid in 10 months with balance supported by contracts and grants
SIP11 - 12 month faculty salary paid in 11 months with balance supported by contracts and grants
IV-3 Adequacy of the Faculty

The Department of Forest Science has an excellent and diverse faculty, and is well positioned to fulfill its mission and goals. The recent addition of seven new faculty members enabled the Department to be well positioned to meet our strategic goals for the future, as defined by the forestry sector and our students, and to be successful in achieving our teaching, research, extension, and service objectives. Our faculty members, as evidenced by their vitae, are active both nationally and internationally in professional societies, and education, research and scholarly collaborations.

IV-4 Recruitment, Tenure and Promotion Policies

The Texas A&M University policy with regard to recruitment, tenure and promotion governs all aspects of faculty recruitment and employment, as well as, retirement and academic freedom, ethics and responsibility. Tenure and promotion guidelines are included in the referenced rules and include criteria for requests for promotion and tenure. The basis for evaluation for all faculty is the quality and scope of their work in fulfillment of the multiple missions of Texas A&M University, in the context of the particular roles and responsibilities of the individual faculty member. Excellence in teaching, scholarly activities, and service are the significant criteria that lead to promotion and tenure recommendations.

IV-5 Faculty Development Leaves

Texas A&M University encourages the faculty members to make use of the policy that allows them to apply for development leave for a semester or nine months with partial financial support provided by the Dean of Facilities. Texas A&M University does not have an official sabbatical program; however, the University with the assistance of the Association of Former Students, funds a Faculty Development Leave Program. This past year approximately 65 faculty members participated in the program. Faculty development leaves are funded at full pay for one semester or one-half pay for two semesters. Faculty members on these types of leaves may accept grants for study, research, or travel, but may not accept employment from other sources.

Qualifications for receiving permission for faculty development leave include the following:
- A minimum of five consecutive academic years of service in a full-time tenured or tenure track position.
- Faculty status at the time the leave is to begin.
- Hold tenure at the time leave is to begin.
- Expectation of resuming full-time faculty status at Texas A&M University for at least one academic year at the conclusion of the leave period.
- Not have received a faculty development leave in the five-year period immediately proceeding the requested start date for the leave.

All proposals for faculty development leave are evaluated at the college and library level by a committee to include faculty representation. Proposals endorsed by the dean or director of the library are then submitted to the Office of the Provost for further review and final approval by a
committee comprised of one elected faculty member from each college and the library and chaired by the Provost.

In any one Academic year, the number of faculty development leaves funded from all University sources normally may not exceed six percent of the total number of full-time faculty members within a college or the library.

**IV-6 Workload Balance**

On average, Forest Science faculty appointments include 46% teaching, 46% research, and 8% Texas Forest Service responsibilities (Table IV-3). If only faculty with teaching appointments are considered, the average teaching appointment is 51% teaching and 46% research and 3% Texas Forest Service responsibilities. There is some variation in individual appointments of tenure-track faculty, with teaching appointments ranging from 33% to 75% FTE. Individual differences in appointment responsibilities appropriately reflect differences in faculty professional strengths and objectives. Overall, the distribution of workload responsibilities provides a balance that enables the Department to achieve its various missions in teaching, research and extension programs. In addition, graduate teaching assistants are generally available for those faculty members requesting them. This assistance helps the faculty maintain a productive workload balance while simultaneously providing teaching experience for our graduate students. As expected, specific appointment responsibilities for individual faculty have evolved through time as a result of annual review discussions and strategic decisions, and generally reflect perception of future opportunities, and funding and resource acquisition success.

Forest Science faculty generally has responsibility for teaching both undergraduate and graduate courses. Twelve tenure-track and two non-tenure track faculty teach courses contributing to the curriculum (Table IV-3).

The policies of the Texas A&M University require that Faculty Workload reports be completed on a semester basis. The workload report is an automated system based on courses taught, credit hours based on course level, and number of students in a course section. Faculty with 33% funding from Education and General Funds are expected to teach the equivalent of one three-hour course per semester, and, following that, workload factors are established for other funding sources on a proportional basis. In essence, Faculty Workload reports are one mechanism to ensure that teaching funds are not used to support the research program, and visa versa.
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<th>Faculty Member</th>
<th>Budgeted Time Allocation (%)</th>
<th>Short Title</th>
<th>Course #</th>
<th>R¹</th>
<th>S²</th>
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| Total FTE   | 6.57     | 6.85     | 1.24 | 14.66 |
| Average     | 45.71%   | 45.43%   | 7.75%| 98.9% |
| Avg by actual appt. | 50.58% | 46.31% | 2.86%| 99.7% |

1 R' denotes subject is required in Forestry accredited curriculum
2 'S' denotes number of semesters (Fall, Spring, Summer) the subject is taught
3 Denotes that the course is one of two courses classified as required.
4 Annual: Fall or Spring semesters
5 Faculty is Plant Pathology & Microbiology and Entomology - not For Science

SU This course is taught alternate summers.

* Students are in the field for five continuous weeks at Piney Woods Conservation Center

691- Research courses are not included in matrix.
V. PARENT INSTITUTION SUPPORT

V-1 Institutional Strengths and Weaknesses

Texas A&M University has a vision for the future – to be ranked among the top ten public universities, without sacrificing the core values upon which the university is solidly founded or its proud and unique heritage. In the U.S. News and World Report rankings, Texas A&M University is presently listed as 17th. This pursuit of excellence provides the impetus for unconditional support to the colleges in development, implementation, and achievement of their goals and missions.

In Spring 2004, Texas A&M University had 33,361 students enrolled in undergraduate programs, 4,509 enrolled in masters programs, 3,229 enrolled in doctoral degree programs, and 501 in professional degree programs, for a total enrollment of 41,600 students. During this period, there were 5,198 undergraduate students, 631 masters students, and 550 doctoral students in the College of Agriculture and Life Sciences (COALS), for a total enrollment in COALS of 6,379 students, or approximately 15% of the TAMU total enrollment. During Spring 2004, enrollment in the Department of Forest Science included 55 undergraduate, 13 masters, and 8 doctoral degree students.

With a Fall 2003 student-faculty ratio of 21:1, Texas A&M University is just above the median for peer institutions. Within the Department of Forest Science undergraduate curriculum courses, that ratio is 8.5:1 (students to faculty). This ratio is conducive to quality instruction and hands-on training opportunities.

The strength of the University and this Department lies in the resources available to achieve our commitment to the Vision 2020 initiatives, including goals to 1) elevate our faculty and their teaching, research and scholarship; 2) attract and retain high quality, committed students; 3) strengthen our graduate programs; and 4) attain resource parity with the best public universities. With the goal of becoming a member of the elite top ten public universities, Texas A&M has focused and expanded its institutional resources to pursue the challenge of achieving the degree of excellence that marks all great institutions.

Texas A&M University offers bachelor’s, post-bachelor’s certificate, master’s, doctoral, and first professional degrees in almost 160 courses of study administered by the College of Agriculture and Life Science, College of Architecture, Lowry Mays College and Graduate School of Business, College of Education, Dwight Look College of Engineering, College of Geosciences, College of Liberal Arts, College of Science, College of Veterinary Medicine, and the George Bush School of Government and Service.

The 2003 average freshman SAT score was 1189 (U.S. average – 1019) and the ACT score was 26 (U.S. average – 21). The 2003 incoming graduate GRE score was 1171 (U.S. average – 1048). A&M seeks to attract the brightest and best students, and graduates of Texas A&M University are highly sought after by employers.
Texas A&M educational programs are accredited in various specific disciplines, and the Southern Association of Colleges and Schools (SACS) provides overall institution accreditation. The Society of American Foresters currently accredits the Department of Forest Science undergraduate degree option in Forest Resource Management leading to a Bachelor of Science in Forestry.

Documents resulting from the Vision 2020 process at Texas A&M provide a reasonable overview of the University's aspirations for excellence, and a summary of some specific challenges to achieving their overall goal. The following passages are directly taken from those documents, as they are relevant to this review of institutional strengths and weaknesses.

The Vision 2020 documents state:

Texas A&M University is committed to improvement. We have faced challenges, accepted change, and improved, while responding to a dynamic environment. Planning and accomplishing goals are part of the culture of Texas A&M University. While we desire to be, and to be recognized as, one of the ten best public universities in America, we cannot sacrifice the existing strengths and qualities that have carried us to where we are today. We must balance our distinctiveness and the common traits of the best universities in America. If we meet the challenge, we will not only be recognized for our excellence nationally, we will also be able to add value to our students, our faculty, and the State of Texas as an educational leader.

There will undoubtedly be significant differences between the great universities of today and the great universities of 2020. At the same time, these differences will not affect the core of what an institution of higher learning is. Great faculties are indispensable. Gifted and attentive students are needed. Scholarship of the first order is required. Libraries and access to knowledge resources are part of the foundation. Change will affect every aspect of university life, and our willingness and ability to change is our greatest asset. Many characteristics distinguish us nationally. We fare very well in our ability to attract National Merit Scholars. Some programs, such as our nautical archaeology unit and its affiliated Institute of Nautical Archeology, are the best in the entire world. Our chemistry program is consistently identified as outstanding, the more remarkable for the dramatic growth it has experienced in the last three decades. The colleges of Agriculture and Life Sciences, Business, Engineering and Veterinary Medicine are frequently cited as among the very best in the nation. Education for leadership is a fundamental and distinctive part of our campus life. Our ability to engender an attitude of good stewardship marks us; we have the lowest ratio of administrative to general costs of any university in Texas. Today, an expansive physical plant reminds us of the intensity of our growth. We have many existing strengths in which we can and do take pride. Our greatest strength, though, is our desire to be better.

The destiny of Texas is inextricably linked to the level of quality of its premier institutions of higher education. A report of the Texas Commission on Higher Education said in
1987, 'We believe higher education is vital to human advancement and that support for higher education reveals a society’s commitment to progress.'

Some may say Texas A&M University has made great progress in the last three decades and that we are good enough. They are right on the first point but wrong on the second. They are wrong for two reasons. First, what distinguishes the human species is the opportunity to improve our condition and seek new levels of understanding of humankind and nature. Anything but continuing to strive to be the best is just not acceptable. It is clear; Texas A&M University must continue its quest for excellence at both the undergraduate level, which is reflected in the U.S. News & World Report ranking, and the graduate level, which is seen in the lack of ranking at all by the National Research Council.

The second reason those who say we are good enough are wrong is that we live in a global world of great change and advancing technology. In such a world, competitive excellence is defined by more rigorous national and global standards. Goods, ideas, people, and students flow readily from place to place. The state and our region will not prosper if we fail to measure ourselves by standards accepted the world over. Many of Texas's best students will go elsewhere, and those who remain will be disadvantaged. The state will not prosper economically if our best and brightest leave or cannot obtain the requisite opportunity to develop their talents.

Our student-faculty ratio is 25 percent higher than the best public institutions. Even in our strong colleges we have far too few National Academy members. Doctoral programs, especially in the social sciences and humanities, need development or need improvement by objective comparison through the National Research Council. Our graduate student population, while large in absolute numbers, is too small at 18 percent of the total student population; the best institutions have graduate student populations of more than 30 percent. Total research expenditures place us in the top ten nationally. However, our federally funded research expenditures, those attained through national competition, are only 63 percent of those at the best public universities. Our library has 1/3 the volumes and 1/5 the serials of the best public institutions.

Underfunding is the root cause of unfavorable comparisons to the best public institutions and prevents us from providing the same level of opportunity to our students. An objective evaluation of our position reveals an inescapable conclusion: As much progress as we have made, we are not yet a nationally prominent institution. Compared to the best public institutions, we significantly underspend them. Our spending in 1997 dollars per student ($9,500) is approximately half that of the best public institutions. Only 17 percent of the total ($1,600) comes from our participation in the Permanent University Fund, the state support that was originally intended to assure excellence in the state's flagship universities. How good we are is testament to our careful use of the resources we have had.

Excellence in people, programs, and opportunity is required for greatness and to be competitive with the best national institutions. Seemingly incremental changes, like so
many of those required to move us from the position of being an “A” institution to an “A+” institution, are as dramatic as any changes the institution has ever set out to accomplish. Significant resources will be required. Visionary leadership; a commitment to excellence on the part of every faculty member, staff member, and student; and the willingness to take considered risks are all as important as financial resources.

V-2 Institutional Financial Support

The Texas A&M University System supports the College of Agriculture and Life Sciences and the Department of Forest Science at adequate levels to enable the realization of its mission. This conclusion can be seen in the overall financial support received for the period, including expenditure trends on the college and department levels (Table V-1 (2003)). State appropriated funding levels for the teaching program for the Department of Forest Science averaged $601,455 annually through the five-year period. Note that the funding levels in Table V-1 report funds from specific state appropriated accounts for ease of comparison to other departments and colleges, and that the total amount of funding received by the Department of Forest Science is greater due to additional sources not reported above.

The total FY03 funding level for the teaching program was $1,031,311, or an amount of funding that equals about $143,000 per teaching faculty FTE. Comparison with the Southern NAPFSC group in 2002-2003 indicates the Department of Forest Science ranks among the top four Southern forestry programs, when compared on a dollar per FTE basis (Table V-2), and is well above the average for the 17 schools reporting. These comparative data bases suggest funding in support of our educational programs in Forest Science at Texas A&M is adequate to achieve a high standard among its peer institutions regionally.

V-3 Institutional Support Program for Students

Through its Division of Student Affairs, Texas A&M University provides outstanding support for student programs. The Division of Student Affairs is composed of the following institutional units – the Corps of Cadets, Memorial Student Center, Multicultural Service, Office of the Vice President, Recreational Sports, Residence Life, Special Events Facilities, Student Activities, Student Counseling Service, Student Financial Aid, Student Health Service, Student Life, Student Life Studies, and the University Art Collections and Exhibitions.

The Career Center at Texas A&M University offers students an opportunity to receive guidance in various aspects of their career and job research. Their resumes may be reviewed and they are offered information on various interview techniques, dressing, how to prepare for a visit to a potential employer, and how to negotiate salaries and benefits. Each of these units provides a unique service to the students, as can be seen in brief description of the units and their services. Dr. Bill Kibler, Interim Vice President for Student Affairs, leads the Division of Student affairs.
The Center for Academic Enhancement offers a variety of learning assistance programs designed to develop and improve skills necessary for success in college-level courses. The Texas A&M University Writing Center located at Evans Library is a resource for undergraduate students and faculty who need assistance at any stage of the writing process, ranging from one-to-one sessions to computer-based instruction and writing development programs.

The Center for Teaching Excellence strengthens the academic experience of the diverse faculty, graduate students, and undergraduate student by providing support for teaching and learning at Texas A&M University. The Center initiates and supports efforts to develop effective and innovative teaching and learning practices, and assists faculty and teaching assistants to develop courses and teaching practices that produce students who reflect the values and goals of the Texas A&M University standards. They encourage and facilitate collegiality among students, faculty, administrators, and staff for the improvement and enrichment of the programs here at Texas A&M University.

V-4 Funding for Operations, Professional Improvement, and Travel

The College of Agriculture and Life Sciences provides adequate funding for the operation of the unit, when considering course expenditures and other applicable costs. There are funding-request opportunities available for travel and professional improvement. Requests for travel to meetings, training opportunities, and other interaction among peers are customarily approved, and funds are provided by various means available to the Dean and the Department Head. Additionally, the Dean of Faculties has grants available for professional development leave within the guidelines of University policies. The College of Agriculture has a faculty work station funding program and the Department of Forest Science has a combination of funding sources that ensures that all faculty have the opportunity to acquire state-of-the-art computers and peripheral equipment, as well as specialized classroom, laboratory, and field instruction support equipment for educational programs.

Through student fees and other sources, including recently acquired endowments, the Department provides sufficient transportation and supplies to enable the faculty and students to achieve excellence in academic endeavors. The Department maintains and updates indoor and field teaching equipment as necessary to retain state-of-the-art technologies in the practice of forestry.

V-5 Libraries

Texas A&M University libraries provide an environment conducive to learning, research, and information resources. The resources available include the following full-service facilities: Evans Library, West Campus Library, Cushing Library, Policy Sciences and Economics Library, Medical Sciences Library, Bush Library, and the Texas A&M University Digital Library.
V-6 Faculty Salaries

Faculty salaries at Texas A&M University are among the highest in the South, when compared with 15 other forestry institutions within the membership of the Southern Region of the National Association of Professional Forestry Schools and Colleges (So NAPFSC) (Table V-3). More specifically, Texas A&M University faculty salaries rank among the top three on mean average salaries for Professor and Associate Professor, and rank fourth for average Assistant Professor salaries. This comparison was based on 12-month salary rates.

A Texas A&M University-based comparison of 9-month salary rates with selected peer institutions, and within the College of Agriculture and Life Sciences, indicates Department of Forest Science salaries range between 90 and 97 percent (average of 94% for all ranks) of peer institution salaries. However, among COALS departments for all ranks, Forest Science faculty salaries ranked 13th of 14 departments, and were about $7,500 less than the college average, with largest differences in Assistant Professor salaries (Tables V-4 and V-5).

V-7 Computer Resources

One of the major resources located on the Texas A&M University campus is the Computing Information Services. A host of platforms, including Unix, DEC, IBM mainframes, as well as the CIS Supercomputing Facility support the intense computing needs of the institution. CIS also provides support for the administration and staff by providing various services and repairs, including assistance with the installation and maintenance of servers and other customer applications. CIS provides the external web-related base and firewall that provides access to external resources with appropriate protection. The CIS operates six Open Access Computing Facilities on campus, including one on the ground floor of the Horticulture/Forest Science building. These facilities provide students and faculty with convenient and complete access to computers, peripherals, software, and connectivity to the network, Internet and electronic mail. CIS services and maintains the central servers that provide the database, systems support, technologies, and operating systems and related utilities to the institution. Student Information Management Systems (SIMS) includes information for every student enrolled at Texas A&M University and is responsible for the systems that allow students to register by telephone or remotely from authorized terminals. The CIS is responsible for the maintenance, operation, user training, support and service for the database system. The supercomputing facility is dedicated to providing the hardware, software and related services required by the TAMU faculty and students for research and educational needs, as well as the Financial Accounting Management Information Systems (FAMIS) that is the database for the accounting, finances, payroll and other management functions of the institution. CIS also offers multiple levels of training in computer software applications.

There are a multitude of other services provided by the system for students including the following – Environmental Health and Safety Department, Food Services, Graphics Services, Texas A&M Children’s Center, Texas A&M Emergency Medical Services,
Texas A&M University Telecommunications, Transportation – Bus Operations, University Police Department, Virtual Volunteer Services Center, Women's Center at Texas A&M University, and the Texas A&M Bookstore.

Texas A&M provides a strong, well-staffed student support services network with quality faculty and staff.
Table V-1. Summary of expenditures by college and category in FY2003.

<table>
<thead>
<tr>
<th>College</th>
<th>Benefits</th>
<th>Operations and Maint</th>
<th>Salaries Faculty</th>
<th>Salaries Non-Faculty</th>
<th>Scholarships/Grants</th>
<th>Utilities</th>
<th>Wages</th>
<th>Grand Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>AA - Provost Accounts</td>
<td>$7,840,405</td>
<td>$53,866,894</td>
<td>$7,417,140</td>
<td>$50,871,941</td>
<td>$8,341,809</td>
<td>$218,772</td>
<td>$6,294,301</td>
<td>$134,851,263</td>
</tr>
<tr>
<td>AG - Agricultural And Life Sciences</td>
<td>$728,051</td>
<td>$6,444,383</td>
<td>$15,795,199</td>
<td>$8,347,200</td>
<td>$1,858,775</td>
<td>$10,791</td>
<td>$816,825</td>
<td>$34,001,224</td>
</tr>
<tr>
<td>AR - Architecture</td>
<td>$474,376</td>
<td>$3,559,831</td>
<td>$6,653,394</td>
<td>$4,913,923</td>
<td>$257,988</td>
<td>$105,491</td>
<td>$405,198</td>
<td>$16,370,202</td>
</tr>
<tr>
<td>BA - Mays School Of Business</td>
<td>$793,833</td>
<td>$4,758,643</td>
<td>$14,799,377</td>
<td>$6,551,661</td>
<td>$1,279,387</td>
<td>$403</td>
<td>$892,340</td>
<td>$29,075,644</td>
</tr>
<tr>
<td>BU - Bush School Of Gov'T &amp; Public Srv</td>
<td>$50,524</td>
<td>$876,054</td>
<td>$1,288,228</td>
<td>$1,474,776</td>
<td>$575,972</td>
<td>$25</td>
<td>$110,928</td>
<td>$4,376,507</td>
</tr>
<tr>
<td>ED - Education</td>
<td>$718,304</td>
<td>$4,701,770</td>
<td>$11,344,758</td>
<td>$5,698,679</td>
<td>$610,629</td>
<td>$1,088</td>
<td>$901,518</td>
<td>$23,976,665</td>
</tr>
<tr>
<td>EN - Engineering</td>
<td>$932,329</td>
<td>$8,484,936</td>
<td>$29,160,147</td>
<td>$11,078,234</td>
<td>$2,770,116</td>
<td>$1,629</td>
<td>$1,285,243</td>
<td>$53,712,275</td>
</tr>
<tr>
<td>GE - Geosciences &amp; Maritime Studies</td>
<td>$296,898</td>
<td>$5,211,589</td>
<td>$6,222,979</td>
<td>$4,989,765</td>
<td>$441,241</td>
<td>$888</td>
<td>$355,993</td>
<td>$17,619,353</td>
</tr>
<tr>
<td>LA - Liberal Arts</td>
<td>$827,491</td>
<td>$6,995,460</td>
<td>$25,727,500</td>
<td>$9,764,706</td>
<td>$556,937</td>
<td>$2,154</td>
<td>$1,171,155</td>
<td>$45,045,402</td>
</tr>
<tr>
<td>MD - Medicine</td>
<td>$6,614</td>
<td>$6,614</td>
<td>$6,614</td>
<td>$6,614</td>
<td>$6,614</td>
<td>$6,614</td>
<td>$6,614</td>
<td>$6,614</td>
</tr>
<tr>
<td>SC - Science</td>
<td>$1,204,938</td>
<td>$12,983,396</td>
<td>$21,330,201</td>
<td>$16,530,068</td>
<td>$780,418</td>
<td>$651</td>
<td>$1,217,213</td>
<td>$54,046,886</td>
</tr>
<tr>
<td>VM - Veterinary Medicine</td>
<td>$303,844</td>
<td>$18,449,333</td>
<td>$13,576,849</td>
<td>$10,750,661</td>
<td>$459,175</td>
<td>$31,715</td>
<td>$1,891,775</td>
<td>$45,463,552</td>
</tr>
<tr>
<td>Grand Total</td>
<td>$14,170,993</td>
<td>$126,439,103</td>
<td>$153,315,772</td>
<td>$130,971,614</td>
<td>$17,932,447</td>
<td>$373,168</td>
<td>$15,342,490</td>
<td>$458,545,586</td>
</tr>
</tbody>
</table>
Table V-2. Teaching budget comparison with Southern NAPFSC FY 2003-2004 compares TAMU funding for teaching and comparable institutions.

<table>
<thead>
<tr>
<th>University-SoNAPFSC</th>
<th>Unit</th>
<th>State Funds</th>
<th>Other Funds</th>
<th>Total Funds</th>
<th>FTE Teaching</th>
<th>Funding (000)/FTE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alabama A&amp;M University</td>
<td>CFE</td>
<td>$235,000</td>
<td>$175,100</td>
<td>$410,100</td>
<td>3.30</td>
<td>124</td>
</tr>
<tr>
<td>Auburn University</td>
<td>For&amp;Wld</td>
<td>$1,708,206</td>
<td>$ -</td>
<td>$1,708,206</td>
<td>7.93</td>
<td>215</td>
</tr>
<tr>
<td>Clemson University</td>
<td>For Res</td>
<td>$1,408,669</td>
<td>$5,050</td>
<td>$1,413,719</td>
<td>7.90</td>
<td>179</td>
</tr>
<tr>
<td>Louisiana State University</td>
<td>RNR</td>
<td>$792,298</td>
<td>$ -</td>
<td>$792,298</td>
<td>8.42</td>
<td>94</td>
</tr>
<tr>
<td>Louisiana Tech University</td>
<td>Forestry</td>
<td>$697,240</td>
<td>$ -</td>
<td>$697,240</td>
<td>7.91</td>
<td>88</td>
</tr>
<tr>
<td>Mississippi State University</td>
<td>FO/FP</td>
<td>$1,570,621</td>
<td>$ -</td>
<td>$1,570,621</td>
<td>14.31</td>
<td>110</td>
</tr>
<tr>
<td>North Carolina State University</td>
<td>For</td>
<td>$6,986,982</td>
<td>$ -</td>
<td>$6,986,982</td>
<td>42.59</td>
<td>164</td>
</tr>
<tr>
<td>Oklahoma State University</td>
<td>Forestry</td>
<td>$464,357</td>
<td>$40,000</td>
<td>$504,357</td>
<td>4.79</td>
<td>105</td>
</tr>
<tr>
<td>Southern University and A&amp;M College (Baton Rouge)</td>
<td>Urban For</td>
<td>$500,689</td>
<td>$ -</td>
<td>$500,689</td>
<td>4.25</td>
<td>118</td>
</tr>
<tr>
<td>Stephen F. Austin State University</td>
<td>College</td>
<td>$1,211,560</td>
<td>$ -</td>
<td>$1,211,560</td>
<td>16.20</td>
<td>75</td>
</tr>
<tr>
<td>Texas A&amp;M University</td>
<td>FRSC</td>
<td>$653,544</td>
<td>$388,313</td>
<td>$1,041,857</td>
<td>6.94</td>
<td>150</td>
</tr>
<tr>
<td>University of Arkansas</td>
<td>Forestry</td>
<td>$696,667</td>
<td>$ -</td>
<td>$696,667</td>
<td>5.57</td>
<td>125</td>
</tr>
<tr>
<td>University of Florida</td>
<td>FR&amp;C</td>
<td>$1,068,863</td>
<td>$247,754</td>
<td>$1,316,617</td>
<td>6.10</td>
<td>216</td>
</tr>
<tr>
<td>University of Georgia</td>
<td>SFR</td>
<td>$2,167,431</td>
<td>$ -</td>
<td>$2,167,431</td>
<td>18.31</td>
<td>118</td>
</tr>
<tr>
<td>University of Kentucky, College of Agriculture</td>
<td>Agriculture</td>
<td>$330,967</td>
<td>$ -</td>
<td>$330,967</td>
<td>2.80</td>
<td>118</td>
</tr>
<tr>
<td>University of Tennessee</td>
<td>FWF</td>
<td>$790,726</td>
<td>$40,210</td>
<td>$830,936</td>
<td>7.18</td>
<td>116</td>
</tr>
<tr>
<td>Virginia Polytechnic Institute and State University</td>
<td>For/WS&amp;FP</td>
<td>$2,499,428</td>
<td>$ -</td>
<td>$2,499,428</td>
<td>27.28</td>
<td>92</td>
</tr>
<tr>
<td><strong>AVERAGE</strong></td>
<td></td>
<td><strong>$1,399,015</strong></td>
<td><strong>$48,088</strong></td>
<td><strong>$1,451,746</strong></td>
<td><strong>11.26</strong></td>
<td><strong>130</strong></td>
</tr>
</tbody>
</table>
Table V-3. Faculty salary comparison with Southern NAPFSC 2003-2004 compares TAMU salary rates for faculty with comparable institutions.

<table>
<thead>
<tr>
<th>Institution</th>
<th>Professor</th>
<th>Faculty Salaries/Associate Professor</th>
<th>Assistant Professors</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
<td>Mean</td>
<td>High</td>
</tr>
<tr>
<td>Alabama A&amp;M University</td>
<td>77,070.00</td>
<td>95,069.00</td>
<td>123,130.00</td>
</tr>
<tr>
<td>Auburn University</td>
<td>73,006.00</td>
<td>93,989.00</td>
<td>129,689.00</td>
</tr>
<tr>
<td>Clemson University</td>
<td>59,322.00</td>
<td>84,085.00</td>
<td>98,522.00</td>
</tr>
<tr>
<td>Louisiana State University</td>
<td>58,498.00</td>
<td>59,605.00</td>
<td>60,713.00</td>
</tr>
<tr>
<td>Mississippi State University</td>
<td>73,650.00</td>
<td>84,976.00</td>
<td>96,732.00</td>
</tr>
<tr>
<td>North Carolina State University</td>
<td>87,771.00</td>
<td>104,910.00</td>
<td>146,400.00</td>
</tr>
<tr>
<td>Oklahoma State University</td>
<td>68,100.00</td>
<td>82,851.00</td>
<td>105,798.00</td>
</tr>
<tr>
<td>Southern University and A&amp;M College (Baton Rouge)</td>
<td>85,180.00</td>
<td>82,289.00</td>
<td>82,984.00</td>
</tr>
<tr>
<td>Stephen F. Austin State University</td>
<td>71,488.00</td>
<td>80,101.00</td>
<td>92,720.00</td>
</tr>
<tr>
<td>Texas A&amp;M University</td>
<td>87,603.00</td>
<td>100,303.00</td>
<td>107,210.00</td>
</tr>
<tr>
<td>University of Arkansas</td>
<td>no data</td>
<td>no data</td>
<td>no data</td>
</tr>
<tr>
<td>University of Florida</td>
<td>77,443.00</td>
<td>89,013.00</td>
<td>109,850.00</td>
</tr>
<tr>
<td>University of Georgia</td>
<td>no data</td>
<td>no data</td>
<td>no data</td>
</tr>
<tr>
<td>University of Kentucky, College of Agriculture</td>
<td>67,037.00</td>
<td>73,685.00</td>
<td>81,290.00</td>
</tr>
<tr>
<td>University of Tennessee</td>
<td>73,247.00</td>
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63
Table V-4. Comparison of salaries (9-month basis) among colleges at Texas A&M across all professorial ranks.

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<th>College</th>
<th>Texas A&amp;M</th>
<th>Peer Group</th>
<th>Rel. Mkt*</th>
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<td>Faculty Rank</td>
<td>Avg. Salary</td>
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<td>Assist Prof</td>
<td>$50,869</td>
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*TAMU average salary divided by peer average salary (1) Peer averages are weighted by TAMU faculty distribution
Prepared by Office of Institutional Studies and Planning, 30-Apr-04, 09:06 AM Page 1 of 1
Table V-5. Comparison of salaries (9-month basis) among departments in the Ag Program at Texas A&M across all professorial ranks.

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<th>DEPT</th>
<th>Faculty Rank</th>
<th>Texas A&amp;M Avg. Salary</th>
<th># Faculty</th>
<th>Peer Group Avg. Salary</th>
<th># Faculty</th>
<th>Rel. Mkt*</th>
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</table>

TAMU average salary divided by peer average salary; peer averages are weighted by TAMU faculty distribution.
Prepared by Office of Institutional Studies and Planning, 14-Apr-04, 10:07 AM
VI. PHYSICAL RESOURCES AND FACILITIES

VI-1 On-Campus Facilities

The Department of Forest Science occupies space in four buildings on the Texas A&M University Campus and uses additional facilities for some laboratory classes. The departmental offices, the Extension Program and many faculty offices, classrooms, and research labs are located in the Horticulture/Forest Science Building (HFSB). Additional facilities are located in the Spatial Sciences Laboratory, the Forest Science Laboratory, the Wood Engineering Laboratory, and the Norman Borlaug Center for Southern Crop Improvement. Much of this space is relatively new. Extension personnel are also located at the Overton Center. The department does not own forestland but has agreements to use lands as described below.

Horticulture/Forest Science Building

The Horticulture/Forest Science Building was first occupied by the Department of Forest Science in 1984 and is shared with the Horticultural Sciences Department. This proximity results in several collaborations between Forest Science and Horticulture faculty. HFSB is located on the West Campus. West Campus has become the major center for research and teaching in the life sciences. In addition to most departments in the College of Agriculture and Life Sciences, the business, veterinary, and medical schools are located on West Campus. The West Campus Library (WCL) is located a very short distance from HFSB.

Classrooms

Most lecture rooms are shared with the Department of Horticulture and occasionally with other departments as scheduling allows. Within HFSB, most Forest Science lectures are held in three classrooms (101, 105, and 124) and one large lecture hall (102). All rooms contain slide, overhead, and data projectors. Room 101 contains TTVN equipment needed for interactive communication with remote locations. Laboratories are held in rooms 306 (Interpretation of Aerial Photos), 126 (Dendrology, Arboriculture (both also held outside) and Wood Technology), 301 (parts of AGLS 201) and the computer open access lab (AGLS 201). The Forest Protection lab is held in the nearby Heep Center, home to the Department of Entomology. Laboratories for GIS courses are held in the Spatial Sciences Laboratory (described below). Laboratories related to wood technology are held in the Wood Engineering Laboratory in the Hobgood Building. The West Campus Media Center is located in HFSB and will provide and set up equipment (slide, overhead, and media projectors, computers, televisions, VCRs) needed for lectures or seminars.

Distance education and non-classroom-based education are facilitated by computers and support staff. The Department of Forest Science maintains two servers and employs a part-time computer support staff member. Course materials can be made available on-line with these resources. The university provides access to Web-CT and frequent training sessions. The Agriculture Program maintains a distance education center in the Centeq Building.
Office Space

Within HFSB, the Department of Forest Science has 5602 ft\(^2\) of office space and office support space for faculty, staff, administration, graduate students, and undergraduate students. This includes space for the Forestry Club and the Student Chapter of the International Society of Arboriculture. There are also two conference rooms of 585 and 300 ft\(^2\). Additional office space for faculty, staff, and graduate students is located in the Spatial Sciences Lab, the Borlaug Center, and the Forest Sciences Lab (all described below).

Computer Laboratories

Within the department, there are two 125 ft\(^2\) computer labs for undergraduate and graduate student use. The undergraduate computer lab contains four Dell Pentium III computers, and a laser printer. The graduate and graphics lab contains one Pentium III and one Pentium IV computer, a laser printer, a color printer, a scanner, and slide-making equipment. The computers have Internet connections and an assortment of software applications. An additional 565 ft\(^2\) laboratory is used for a variety of computer related purposes including teaching, housing of teaching assistants for computer labs, and research. An open access lab (OAL) is located on the first floor of HFSB. It is one of seven open access computer labs on campus available to students, faculty, and staff. Equipment varies from lab to lab, but combined, they provide Pentium - based IBM compatible PCs, Apple Macintosh systems, Sun SPARC stations, SGI workstations (which provide access to the campus Supercomputers), optical scanners and a variety of high capacity printers. The HFSB open access lab contains 34 Gateway Pentium III computers with Internet connections and two Xerox laser printers. A much larger OAL is located in the nearby West Campus Library. There are 150 computer workstations with Internet access as well as a classroom with 40 computer workstations in the WCL lab.

Research Laboratories

Research Labs are distributed in all the departmental on-campus buildings including HFSB, the Spatial Sciences Lab, the Borlaug Center, and the Forest Sciences Lab. Within HFSB, there is 6466 ft\(^2\) of lab space. Some of this space is also used for teaching. The labs within HFSB primarily support research and training in genetics, molecular biology, plant physiology, ecology, urban forestry, computer analyses, and aerial photo interpretation. Additional lab space is described below.

Other HFSB Facilities

Greenhouse – The Department of Forest Science maintains two 1500-ft\(^2\) greenhouses immediately behind HFSB. Additional greenhouse space is available in the Borlaug Center next door.

Atrium – HFSB has a lovely 1700-ft\(^2\) atrium complete with live plants and artistic displays by the Benz Gallery. The atrium provides students with a place to relax or study between classes and also serves as a venue for departmental celebrations and get-togethers.
Forest Science Lab

The Forest Science Lab is located on Agronomy Rd., a short distance north of HFSB. The FSL provides laboratory space for research in silviculture, ecology, soils, and tree cytogenetics, and houses graduate students working in those areas. The department of Forest Science maintains 690 ft² of office space, 1730 ft² of “dirty” and “clean” lab space, and historically had 2670 ft² of storage and wood shop space that is currently being renovated to facilitate locating the tree molecular cytogenetics laboratory and relocating soil sample processing and analysis operations.

The FSL is also home to the Texas Forest Service Western Gulf Tree Improvement Cooperative. They have approximately 2800 ft² of office space for scientists, staff, and graduate students, and lab space for wood core sample preparation and seed processing. They also have greenhouse (2400 ft²), shadehouse (3600 ft²), and headhouse (500 ft²) space used for seedling production.

The new tree molecular cytogenetics laboratory is being constructed with funding provided by the USDA Forest Service Southern Research Station, and will house office, wet lab, and microscope capability in support of Dr. Nurul Islam-Faridi.

Spatial Sciences Laboratory

The Spatial Sciences Laboratory (SSL) is located in the Centeq Research Plaza west of the Horticulture/Forest Science Building in the TAMU Research Park. The SSL includes a total of 5,050 ft² of laboratory and office space.

Research Laboratories

The SSL provides two research laboratories. These labs are used to carry out all phases of research projects and technology transfer between participating agencies. These offices are equipped with cutting-edge technology to fulfill any project needs.

Teaching Laboratory

The teaching laboratory has been equipped with 12 Pentium IV workstations (20” flat panel monitors, 2 GHz, 512 MB RAM, 80 G hard drives) for conducting university and continuing education courses, with new capacity and equipment being added constantly as funds allow. This room has a variety of multi-media devices such as an overhead projector, slide projector, SMART technology board and a LCD projector.

Graduate Student Office Space

There is office space equipped with personal workstations for approximately 12 graduate students. In addition, there are six faculty/staff offices, a systems/server room and a conference room.
Norman E. Borlaug Center for Southern Crop Improvement

The Norman E. Borlaug Center for Southern Crop Improvement is located next to the Horticulture/Forest Science Building. The Borlaug Center, built in 1993, provides the Institute for Plant Genomics and Biotechnology with a base of operations and houses scientists from seven TAMU departments and the USDA. It provides specialized teaching and research laboratories, infrastructure, and equipment for the plant science community at Texas A&M University. The plant growth facilities include 12,000 ft² of greenhouse space accompanied by 21 growth chambers and three growth rooms all located on the building’s second floor. This greenhouse is primarily for transgenic plants. The Greenhouse Annex has 25,232 ft² of greenhouse space and a headhouse that is 16,473 ft². The Borlaug Center houses two technology development laboratories, The Laboratory for Plant Genome Technologies and The Laboratory for Crop Transformation. The Laboratory for Plant Genome Technologies has a sequencing service as well as considerable shared equipment available to TAMU scientists.

Forest Science faculty, staff, and students use the facilities and equipment in the Borlaug Center in a variety of ways. Dr. Carol Loopstra, her graduate students, postdoctoral associates, and staff are housed in the Borlaug Center. They occupy 1085 ft² of space including three offices and a laboratory. They make extensive use of the shared equipment and plant growth facilities. Other Forest Science faculty, staff, and students use the plant growth facilities and extensive shared equipment for their research projects. Dr. Jean Gould and Dr. Mark Tjoelker use the plant growth facilities. Dr. Claire Williams was a regular user of equipment in The Laboratory for Plant Genome Technologies.

Wood Engineering Laboratory

The Wood Engineering Laboratory is located in the Hobgood Building. It is approximately 3000 ft² and is used by the Department of Biological & Agricultural Engineering and the Department of Forest Science for teaching and research. It contains a variety of equipment used to study wood products including a material test system, a Metriguard 340 E-computer, a stress wave timer, a tension proof tester, a bending tester, a moisture detector, an ultrasonic tester, and a Nicole oscilloscope.

TAMU Library Facilities

Students, staff, and faculty have access to several libraries. The Sterling C. Evans Library and annex is the main campus library. It houses a research quality collection in many fields. The Cushing Memorial Library, adjacent to the Evans Library, houses rare books, special collections, and University archives. The West Campus Library was built to serve the College of Agriculture and Life Sciences, including Forest Science, and the business school. It is only a short distance from HFSB. The Medical Sciences Library is located next to the West Campus Library in the medical school, and is also available for use by Forest Science faculty and students. The Policy Sciences and Economics Library and the George Bush Presidential Library are found in nearby Research Park. The library is a US Government Documents depository and collects 100% of the agriculture titles. The Forest Science collection is at the Evans, Medical Sciences and West Campus Libraries (~2650 titles). Many of the periodicals are available electronically. Other
supporting-research level collections such as genetics (Medical Sciences and Evans), policy science (Policy Sciences and Economics and Evans), entomology (Evans and West Campus) and biology (Evans) are available on campus. The libraries provide Agricola, CAB Abstracts, and Biosis online. A number of other relevant indexes to the literature are available electronically or in print. The Agriculture specialist librarian assigned to the Department of Forest Science is located at the Medical Sciences Library, and is available to give instruction on library use to classes or individuals as needed. Faculties are encouraged to suggest new books and periodicals. The Agriculture Librarian is also the bibliographer for the Forest Sciences collection. The university library holdings include more than 2,700,000 volumes, 37,034 serial titles, 150 newspapers, 170,000 maps, and 4,900,000 microform units. Additional journals are available online. An electronic document delivery system is available for accessing periodical articles in the various libraries as well as those not owned by the libraries. Faculty off-campus also have access to the library materials. None of the libraries is more than a 15-minute walk from HFSB and are all easily access via the campus bus system.

VI-2 Off-Campus Facilities

Overton Center

One Assistant Professor / Forestry Extension Specialist is located at the Texas A&M Agricultural Research & Extension Center – Overton, located on lands donated by the Bruce McMillan Jr. Foundation. A 27,000 ft² main office building, constructed in 1967, houses TAES research faculty, Extension faculty, staff, graduate students, and laboratories. We have access to an auditorium with a 250-seat capacity, a TTVN classroom (40-seat capacity) and two small conference rooms (eight-seat capacity) in the building proper. Forestry Extension currently occupies two offices. Additional outbuildings in the compound provide some greenhouse space, storage for field equipment, and safety storage cage for chemicals.

Summer Camp

Our summer field course (FRSC300) is conducted at the Piney Woods Conservation Center (PWCC), a facility managed by the Arthur Temple College of Forestry, Stephen F. Austin State University (SFASU). The PWCC, completed in 1986, is located approximately 3.5 hours from campus on 25.3 acres on the east side of the Sam Rayburn Reservoir in San Augustine County. The facilities are modern and complete with a dining hall and classrooms, and easily accommodate our students and faculty. The most important aspects of the PWCC are that we share it concurrently with SFASU and that it is immediately adjacent to commercial industrial and National forests. Students from both universities intermingle day and night and grow professionally from this interaction. Some exercises and tours are done jointly.

VI-3 Forest Lands

The Department of Forest Science does not own a school forest but has access to industrial, non-industrial, state, and Capital Area Council of the Boy Scouts of America lands for teaching and research needs. The differences in ownership and ecology give our students access to diverse
experiences. In addition to occasional access to industrial lands for teaching and research, agreements to use the following forestlands are in place.

McMillan Forest

We have an agreement with the Bruce McMillan Jr. Foundation to use 300+ acres of forest land near the Overton Center for demonstrations and research. The 100+ acre McMillan Demonstration Forest is dedicated to demonstrate agroforestry alternatives to non-industrial landowners. The McMillan/Florey Research Forest is being developed into several demonstration/research plots including reforestation trials, stand reclamation studies, density studies, and BMP/SMZ demonstrations to educate professional foresters and NIPFLs. The 107 acre McMillan/Powers Education Forest was added in 2002.

Capital Area Council of the Boy Scouts of America

The Department of Forest Science has a Memorandum of Agreement with the Capital Area Council of the Boy Scouts of America to use lands near Bastrop, TX. The largest property is the Griffith League Ranch. The ranch is 5,000 acres with approximately 4,500 acres of that in timber. There are two additional tracts of land, 400 acres at the Roy D. Rivers Scout Ranch and 563 acres at LCRA Lost Pines Scout Reservation. These properties provide additional opportunities for field-based instruction. Unlike other forests we have access to (McMillan Forests, Texas State Forests, Gibson Tree Farm), these tracts of land are to the west of College Station and include portions of the Lost Pines ecosystem. The Lost Pines are unique populations of drought resistant loblolly pine growing outside the main natural range.

Texas State Forests

The Texas Forest Service (TFS) is part of the Texas A&M University system and our department has close ties to the TFS. TFS employees may hold positions as members of the faculty, teach classes or give guest lectures, and some of our scholarships were initiated to honor former TFS leaders. The state forests are available to the Department of Forest Science for teaching and research activities. There are five state forests totaling 7,314 acres. They are the W. Goodrich Jones State Forest (1,733 acres), I.D. Fairchild State Forest (2,740 acres), E.O. Siecke State Forest (1,722 acres), John Henry Kirby Memorial State Forest (600 Acres) and Masterson State Forest (519 acres). Most are in East Texas but the W. Goodrich Jones State Forest is located approximately 75 minutes from College Station. Information on the state forests is available at: http://txforestservice.tamu.edu/forestry_education/texas_state_forests/index.html

Mustang Prairie - Gibson Tree Farm

The Mustang Prairie - Gibson Tree Farm in Trinity County was owned and managed by G.G. "Hoot" Gibson '29 and his wife Mary Gibson until his death. A portion of the farm has been historically managed for commercial production of loblolly pine. The other portion was used for cattle grazing until 1979 when the Gibsons planted all appropriate land with pine. In 1997, the Gibsons received the Outstanding Tree Farm award. Today, Mrs. Gibson and their three daughters manage the farm for timber with consideration of water, wildlife, recreation, and
aesthetics. Students are welcome to visit the tree farm and do projects. The recipient of the G.G. “Hoot” and Mary Gibson Forestry Scholarship is particularly encouraged to interact with the family and to establish a project on the tree farm.

VI-4 Equipment and Vehicles

Students, faculty, and staff have access to modern research and teaching equipment in spatial sciences and GIS, genomics and molecular biology, computational sciences, ecology, silviculture, soil science, wood science, and other areas. Equipment has been obtained using state and federal funding, industrial contributions, and competitive grants. Two vehicles are available through the department’s main office in HFSB, one is associated with the Spatial Sciences Lab, two are associated with the Forest Science Lab, and one is tied to the Extension program. Additional vehicles are available for use through the university motor pool.

VI-5 Current needs

While current facilities are excellent, there is little room for departmental growth or expansion. Office, storage, and lab space are nearly 100 percent occupied. A goal of the department is to increase the number of undergraduate and graduate students, faculty, post-docs, and staff. If we are to achieve this goal, additional office and classroom space will be needed. In addition, there is a continuous need to update and acquire modern equipment for teaching and research. An arboretum that could be used by the dendrology and urban forestry classes would be a valuable addition to campus. A small creek runs from HFSB to the Bush Library. It is currently used for a dendrology lab but has a limited number of species growing along it. The university eventually plans to develop a walking trail along the creek with more extensive tree plantings. We hope to see a collection containing all native Texas species that can survive the College Station climate, soil, and water as well as trees used in urban settings.
VII. ASSESSMENT

VII-1 Introduction

Most aspects of the Department’s graduate program are assessed periodically using regular student evaluations of courses and faculty, annual surveys of alumni, and reviews of the graduate curriculum as described in Tables VII-1 to VII-5. The data obtained are used to determine how well the program is functioning and what needs to be changed.

In some programmatic areas, regular assessments have been standard for a considerable period of time. However, new means of assessment and criteria for success are periodically added. For example, faculty mentoring committees, and annual performance and dossier reviews by these committees are relatively new to this department.

The department has been participating in the “Institutional Effectiveness Report” (IER) for the Southern Association of Colleges and Schools (SACS) review for several years; however, this year we have added “Student Learning Outcomes” associated with QEP (Quality Enhancement Program) themes. The intended outcomes, means of assessment, criteria for success, and data obtained for the IER are directly applicable to assessment of our graduate program objectives (Section 3 and Table VII-1). In some important areas, we do not have means of assessment currently in place. However, the development of this self-study has resulted in FRSC faculty considering these issues and expanding upon our assessment methods.

VII-2 Assessment Means, Current Status, and Opportunities for Improvement

The following tables (Tables VII-1 to VII-5) outline how the Department of Forest Science assesses the success of our graduate program. Table VII-1 addresses each of the ten graduate program objectives. Tables VII-2 to VII-5 address other areas related to the quality of the program including graduate student diversity, advising, and program management and administration; faculty performance and teaching; curricula and program review procedures; and resources. Within each objective or area, the tables describe 1) the means and when appropriate, the criteria, for assessment, 2) our current status, and 3) areas where we feel we have opportunities for improvement. In most cases, missing data in the “Current Status” column reflect an aspect of the graduate program where data were not previously gathered at the departmental level but we feel are important to include in the future. An example is the lack of information on the quality of graduate student advising provided by the department. In other cases, the preparation of this document resulted in ideas for improving graduate student education. Data are not available because we have recently made changes. An example is the requirement that students participate in the review of manuscripts and grant proposals. Tables VII-1 to VII-5 are intended to be dynamic documents that will change to reflect changes in the goals for the Department and University.
### Table VII-1 Assessment criteria, current status, and opportunities for improvement for graduate program objectives.

**Objective 1) Research: Develop the students’ ability to carry out and complete original research**

<table>
<thead>
<tr>
<th>Means / Criteria for Assessment</th>
<th>Current Status</th>
<th>Opportunities for Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>At least 90% of students submitting and defending a dissertation will meet or exceed the expectations of the advisory committee evaluating the dissertation.</td>
<td>In the past 5 years, all students submitting and defending a dissertation were successful. All students taking FRSC 606 since 2002 have obtained a grade of B or better. Of the 21 Ph.D. students graduating since 1998, 13 have refereed publications resulting from their dissertations. At least 5 others have non-refereed publications. 18 of 21 Ph.D. graduates are employed in academic, research, or research related positions.</td>
<td>Increase the number of students publishing the results of their dissertation and thesis research. Increase student involvement in the preparation of grant proposals.</td>
</tr>
<tr>
<td>A least 90% of students taking FRSC 606 (Research Process) will actively participate and complete the course with a grade of B or better.</td>
<td></td>
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<tr>
<td>At least 75% of those working in knowledge development have patents or patents pending, peer-reviewed publications submitted, in press or in print, or appropriate scholarly achievements. (Survey of graduates and faculty advisors)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>At least 90% of Ph.D. students who seek academic, research, or research related positions are successful. (Survey of graduates and faculty advisors)</td>
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</tbody>
</table>

**Objective 2) Scholarship: Provide the educational opportunities necessary for students to become experts in their area of interest**

<table>
<thead>
<tr>
<th>Means / Criteria for Assessment</th>
<th>Current Status</th>
<th>Opportunities for Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>At least 90% of Ph.D. students taking the written and oral preliminary examinations will meet or exceed the expectations of the advisory committee administering the examinations.</td>
<td>In the past 5 years, all students taking preliminary exams were successful. All students taking FRSC 620 have actively participated and received a grade of B or better. The current graduate student GPR is 3.64.</td>
<td>Offer additional graduate level courses.</td>
</tr>
<tr>
<td>At least 90% of students taking FRSC 620 (Advances and Issues in Forest Science) will actively participate and complete the course with a grade of B or better.</td>
<td></td>
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<tr>
<td>At least 90% (75%) of Ph.D. (MS) students will maintain a GPR of 3.25 or greater. A broad diversity of applicable courses will be available within and outside the department.</td>
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</tbody>
</table>
### Objective 3) Communications: Students will be given the opportunity to strengthen oral and written communication skills

<table>
<thead>
<tr>
<th>Means / Criteria for Assessment</th>
<th>Current Status</th>
<th>Opportunities for Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>At least 90% of students reaching the level of the final defense will give an exit seminar and submit a thesis or dissertation that meet or exceed the expectations of their advisory committee.</td>
<td>Defense - 100% - See Obj. 1 Presentation data not yet available. Publications - See Obj. 1 Teaching - Four of our current graduate students have taught. All students wishing to teach have had the opportunity. All students are provided with the opportunity to participate in the Teaching Academy. Two students took advantage of this opportunity. All students are provided with the opportunity to take Education and Communications courses.</td>
<td>Resurrect the Departmental Seminar Series and require Ph.D. (MS) students to enroll at least twice (once). Increase student publications Increase student involvement in preparation of grant proposals Increase student presentation of research at meetings Increase funding for support of student travel</td>
</tr>
<tr>
<td>At least 50% of students will give a presentation at a professional meeting before graduation. Publication of results (see obj. 1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>At least 90% (75%) of those Ph.D. (MS) students wishing to teach will be given the opportunity to do so.</td>
<td></td>
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</tr>
</tbody>
</table>

### Objective 4) Teaching: Provide the opportunity to develop skills and experience in teaching and teaching methods

<table>
<thead>
<tr>
<th>Means of Assessment</th>
<th>Current Status</th>
<th>Opportunities for Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of students involved in teaching</td>
<td>Teaching - Four of our current graduate students and two who graduated in December 2003 taught at least one class. All students wishing to teach have had the opportunity. All students are provided with the opportunity to participate in the Teaching Academy. Two students attended the Teaching Academy. No students have chosen to take courses in Education. One student received the 2003 COALS Outstanding Graduate Teaching Assistant Award. One student received a 2004 North American Colleges and Teachers of Agriculture (NACTA) Graduate Teaching Assistant Award in a nationwide competition.</td>
<td>Emphasize the value of teaching experience / encourage participation in teaching. Increase the number of teaching opportunities.</td>
</tr>
<tr>
<td>Number of students taking education classes or participating in the Teaching Academy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of students choosing to one or more courses in Education.</td>
<td></td>
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</tbody>
</table>
### Objective 5) Critical Thinking: Challenge students to be critical and analytical thinkers

<table>
<thead>
<tr>
<th>Means / Criteria for Assessment</th>
<th>Current Status</th>
<th>Opportunities for Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>At least 90% of Ph.D. students taking the written and oral preliminary examinations will meet or exceed the expectations of the advisory committee administering the examinations.</td>
<td>In the past 5 years, all students taking preliminary exams were successful. All students taking FRSC 620 have actively participated and received a grade of B or better. The current graduate student GPA is 3.64. 100% of students write a research proposal. Students are not usually asked to review manuscripts or proposals.</td>
<td>Encourage students to participate in preparation of manuscripts and grant proposals. Recommend students as reviewers and encourage students to review manuscripts and grant proposals. Increase the critical mass of graduate students to facilitate discussion groups and journal clubs. Formalize a process whereby students will be given an incomplete in FRSC 620 until they have provided a critical review of at least one manuscript in review for a journal or one proposal in review for funding. The students’ major advisor will normally identify manuscripts or proposals for the students to review.</td>
</tr>
<tr>
<td>At least 90% (75%) of Ph.D. (MS) students will maintain a GPR of 3.25 or greater. All graduate students will write a research proposal that meets or exceeds the expectations of the advisory committee.</td>
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<td></td>
</tr>
<tr>
<td>All (75%) of Ph.D. (MS) candidates be asked to review at least one real manuscript or proposal.</td>
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</table>

### Objective 6) Professionalism: Encourage students to become actively involved in professional societies and academic/community service activities

<table>
<thead>
<tr>
<th>Means / Criteria for Assessment</th>
<th>Current Status</th>
<th>Opportunities for Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>80% of PhD. students and 50% of MS students will be members of a professional society. 80% of all graduate students will participate in departmental, academic or community service activities.</td>
<td>Data not yet available – most graduate students are not a member of a professional society.</td>
<td>Emphasize the value of membership and involvement. Encourage participation. Encourage professional internships</td>
</tr>
</tbody>
</table>
### Objective 7) Recruit high quality students with potential for excellence

<table>
<thead>
<tr>
<th>Means of Assessment</th>
<th>Current Status</th>
<th>Opportunities for Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>GRE / TOEFL scores</td>
<td>Current students are of high quality. The average incoming GRE score was 1126 (V+Q). The average incoming grade point ratio was 3.5.</td>
<td>Provide funding for interviewing</td>
</tr>
<tr>
<td>Incoming GPA</td>
<td></td>
<td>Offer long-term funding with competitive stipends and tuition waivers contingent on performance.</td>
</tr>
<tr>
<td>Universities previously attended</td>
<td>Many of our students come from peer institutions within the US or from top international universities.</td>
<td>Identify &amp; recruit award winning undergraduates</td>
</tr>
<tr>
<td>Award or scholarship winners</td>
<td></td>
<td>Increase placement of graduates in tier one universities.</td>
</tr>
<tr>
<td>Members of professional &amp; honor societies</td>
<td>We would like more applicants with high enough grades and GRE scores to qualify for University level fellowships.</td>
<td></td>
</tr>
<tr>
<td>Publications, papers in press, in preparation etc.</td>
<td></td>
<td></td>
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<td></td>
<td>OGS offers some support for interview travel.</td>
<td></td>
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</tbody>
</table>

### Objective 8) Increase Ph.D. enrollment

<table>
<thead>
<tr>
<th>Means of Assessment</th>
<th>Current Status</th>
<th>Opportunities for Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of graduate students applying for admission</td>
<td>9 Ph.D. student</td>
<td>See objectives 9 and 10</td>
</tr>
<tr>
<td>Number of graduate students admitted</td>
<td>14 Masters students</td>
<td></td>
</tr>
</tbody>
</table>

### Objective 9) Increase levels and numbers of graduate assistantships or fellowships

<table>
<thead>
<tr>
<th>Means of Assessment</th>
<th>Current Status</th>
<th>Opportunities for Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>The numbers of assistantships available (department funding, grants to faculty).</td>
<td>Most students have financial assistance. We could accept more students if we had more assistantships available.</td>
<td>Encourage industry and government agency involvement (to increase assistantships). Increase stipends.</td>
</tr>
<tr>
<td>The funding available for fellowships (University and Department).</td>
<td>We could attract better students if we could make better offers.</td>
<td>Take better advantage of new fellowship programs for minorities.</td>
</tr>
<tr>
<td>Level of funding.</td>
<td>We have some endowments generating assistantship funds.</td>
<td>Increase endowments.</td>
</tr>
<tr>
<td></td>
<td>Current assistantship levels are below those of most NAPFSC schools.</td>
<td>Award assistantships or fellowships from endowments to Ph.D. students.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Increase number of grants supporting Ph.D. students.</td>
</tr>
</tbody>
</table>
### Objective 10) Improve our recruiting strategy

<table>
<thead>
<tr>
<th>Means of Assessment</th>
<th>Current Status</th>
<th>Opportunities for Improvement</th>
</tr>
</thead>
</table>
| Number of graduate students applying for admission | We would like more high quality graduate students in the department but the limiting factor is funding.  
We get more applications than we have positions but some are not of the quality we wish to admit and they are not always in the areas where they are needed.  
We have a good distribution of domestic and international students in the graduate program but would like to increase the number of domestic Ph.D. students.  
We would like to admit more minority students and more women. | Increase the numbers and levels of graduate assistantships and fellowships  
Develop a recruiting website and brochures  
Recruit at professional meetings  
Advertise in society newsletters  
Target high-quality students in forestry and related disciplines  
Need to establish a national presence  
Increase distance education  
See objective 9 |
| Number of graduate students admitted         |                                                                               |                                                                        |
| Diversity of students                        |                                                                               |                                                                        |

### Objective 11) Expand graduate level course offerings that will be attractive to a broad range of students

<table>
<thead>
<tr>
<th>Means of Assessment</th>
<th>Current Status</th>
<th>Opportunities for Improvement</th>
</tr>
</thead>
</table>
| Number of graduate courses offered by FRSC faculty | The department currently offers, has approval to offer, or is seeking approval for 18 graduate courses.  
Additional 400-level courses that can be taken for graduate credit are offered.  
Several new FRSC courses have been added in the past year or will be taught for the first time next year.  
Our student numbers are low so not all classes are offered each year. | Cross-list more courses with other departments  
Advertise FRSC courses that may be of interest to non-FRSC students to increase enrollment and to ensure that a class will "make". |
| Student evaluations of courses offered       |                                                                               |                                                                        |
| Numbers of students taking FRSC courses (FRSC and non-FRSC students) |                                                                               |                                                                        |
| Compare FRSC program with peer or higher tier schools, for ideas to improve the TAMU FRSC program |                                                                               |                                                                        |
Table VII-2 Assessment criteria, current status, and opportunities for improvement for graduate student diversity, advising, and program management and administration.

<table>
<thead>
<tr>
<th>Diversity – diversity in nationality, race, sex, and academic background</th>
<th>Current Status</th>
<th>Opportunities for Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Means of Assessment</td>
<td>Current Graduate Student (all degrees and majors)</td>
<td>Take advantage of new diversity fellowships to recruit more minority students.</td>
</tr>
<tr>
<td></td>
<td>6 female, 18 male</td>
<td>Records of nationality, race, sex, and academic background will be kept by the departmental staff advisor.</td>
</tr>
<tr>
<td></td>
<td>13 domestic, 11 international</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 domestic minority</td>
<td></td>
</tr>
<tr>
<td></td>
<td>See table 3-4.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Advising – quality of advising provided by the student’s advisor, committee, department, Office of Graduate Studies</th>
<th>Current Status</th>
<th>Opportunities for Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Means of Assessment</td>
<td>Current information not available</td>
<td>Obtain regular feedback from students and alumni on potential areas for improvement.</td>
</tr>
<tr>
<td>Survey of current students and alumni. Percent of students rating the advising they have received from the following sources as “good” or higher.</td>
<td></td>
<td>Change annual survey to request more input on advising.</td>
</tr>
<tr>
<td>1) Advisor (Chair of advisory committee)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2) Advisory committee</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3) Departmental staff advisor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4) Office of Graduate Studies</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Program management and administration</th>
<th>Current Status</th>
<th>Opportunities for Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Means of Assessment</td>
<td>All assessment means conducted annually.</td>
<td>Noted in annual reporting forms.</td>
</tr>
<tr>
<td>Annual evaluation of the staff advisor.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annual evaluation of the Assoc. Head for Graduate Programs.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feedback from the Offices of Graduate Studies and Admissions.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feedback from the faculty.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Survey of current students and exit interviews with graduates. - Did they experience problems related to the management and administration of the program?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table VII-3 Assessment criteria, current status, and opportunities for faculty performance and teaching.

<table>
<thead>
<tr>
<th>Performance</th>
<th>Current Status</th>
<th>Opportunities for Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean / Criteria for Assessment</td>
<td>In 2003, one faculty member had a 3-year review (still in progress), one faculty member was evaluated for promotion to associate professor (successful), one faculty member was evaluated for promotion to professor (successful), and four others were given written evaluations by the promotion and tenure committee. All faculty were evaluated by the department head and most were evaluated by their mentors.</td>
<td>Continued input from the mentoring committees.</td>
</tr>
<tr>
<td>The department head evaluates all faculty members annually.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>There is a required 3-year review for non-tenured faculty.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Each faculty member requesting an evaluation by the promotion and tenure committee receives an evaluation and recommendations.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Faculty are evaluated by a mentor or mentoring committee.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tenure-track faculty members are evaluated for tenure and promotion and non-tenure track faculty members are evaluated for promotion following university guidelines.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Teaching</th>
<th>Current Status</th>
<th>Opportunities for Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Means of Assessment</td>
<td>The overall department average for course evaluations was 4.51 out of 5 for the most recent semester. The minimum score was 3.91 and the maximum was 4.92</td>
<td></td>
</tr>
<tr>
<td>Students evaluate every class.</td>
<td></td>
<td>More faculty could use pre- and post-class exams and take advantage of the CTE evaluations.</td>
</tr>
<tr>
<td>Pre- and Post-class exams</td>
<td>See “Performance evaluation” above.</td>
<td>Attend or organize more CTE teaching workshops.</td>
</tr>
<tr>
<td>The Center for Teaching Excellence (CTE) provides evaluations of teaching.</td>
<td></td>
<td>Use mid-semester student evaluations.</td>
</tr>
<tr>
<td>All reviews described above in “Performance” include an evaluation of teaching.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table VII-4 Assessment criteria, current status, and opportunities for curricula and program review procedures.

<table>
<thead>
<tr>
<th>Forest Science Graduate Program</th>
<th>Current Status</th>
<th>Opportunities for Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Means of Assessment</td>
<td>The most recent review was in 2001. The curriculum was changed and the graduate student handbook was updated.</td>
<td>Regular surveys and exit interviews of graduating students to obtain their suggestions for improvement.</td>
</tr>
<tr>
<td>The Graduate Program undergoes periodic reviews and strategic planning by the GPC and the Forest Science faculty.</td>
<td>Data from the most recent survey is being collected.</td>
<td>The annual survey of alumni needs to be changed to make it more specific to the graduate program. We need to increase participation by alumni.</td>
</tr>
<tr>
<td>Annual survey of alumni.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Other Departmental Assessments</th>
<th>Current Status</th>
<th>Opportunities for Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Means of Assessment</td>
<td>The department was last evaluated in 2003 and accreditation was renewed through 2013. First annual change report due August 2004.</td>
<td></td>
</tr>
<tr>
<td>SAF Accreditation – The department is evaluated every 10 years for accreditation by the Society of American Foresters. Annual change reports are required by SAF.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Reviews by the University</th>
<th>Current Status</th>
<th>Opportunities for Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Means of Assessment</td>
<td>This is the first review for FRSC</td>
<td>Use this self study document and the input from the evaluation committee to make meaningful changes to the graduate program.</td>
</tr>
<tr>
<td>TAMU PhD Review – Each Ph.D. program is externally reviewed every seven years.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Reviews of the University</th>
<th>Current Status</th>
<th>Opportunities for Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Means of Assessment</td>
<td>Completed successfully.</td>
<td></td>
</tr>
<tr>
<td>SACS Accreditation</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Table VII-5 Assessment criteria, current status, and opportunities for graduate program resources.

#### Departmental Budget

<table>
<thead>
<tr>
<th>Means of Assessment</th>
<th>Current Status</th>
<th>Opportunities for Improvement</th>
</tr>
</thead>
</table>
| Comparison of numbers and levels of assistantships to those in other departments within TAMU. | Current assistantships are considerably lower than the university and COALS averages.  
Comparison of numbers and levels of assistantships (stipends and tuition waivers) to those in other Southern forestry departments.  
We do not currently have university or departmental funds that can be used for student travel to meetings. | Cover graduate student tuition  
Increase the number and level of graduate student assistantships and fellowships.  
Obtain funds to use for graduate student travel to scientific and professional meetings. |

#### Equipment

<table>
<thead>
<tr>
<th>Means of Assessment</th>
<th>Current Status</th>
<th>Opportunities for Improvement</th>
</tr>
</thead>
</table>
| Feedback from faculty and graduate students on availability and adequacy of needed equipment. | Graduate students in the department have access to most if not all of the modern equipment needed to do their research.  
Graduate students have access to the computers needed. | Obtain input from students when funding for equipment becomes available. |

#### Physical Plant

<table>
<thead>
<tr>
<th>Means / Criteria for Assessment</th>
<th>Current Status</th>
<th>Opportunities for Improvement</th>
</tr>
</thead>
</table>
| Do all graduate students have office space?  
Does the department have adequate facilities for graduate student research?  
Are library resources adequate for student class and research needs? | All students have offices and the department has access to good facilities for research.  
The University has a good library across campus.  
The West Campus Library was turned into a business library. Forestry materials were sent to Evans Library or to the Medical Sciences Library.  
The University subscribes to a large number of electronic journals and the number has continually increased in recent years. | |
VII-3 Assessment Implementation and Anticipated Outcomes

The process for assessing the quality of our graduate program, factors critical to its success, and potential for improvement in the future have been developed recently in response to several commitments the Department and Texas A&M University have made to strengthen the processes necessary to conduct effective program assessment. Although the overall framework for assessment presented above is essentially new, many of the individual review procedures have been in place for many years (e.g. student evaluations of teaching, annual performance reviews of faculty and staff, assessment of the adequacy of department and university resources underpinning departmental education programs), and have been effective in identifying where programmatic and individual improvements should be made.

We anticipate review of the proposed criteria and associated protocols during this current review of our doctoral program, and feedback and experience gained through implementation of our assessment plan will result in improvement in both the assessment protocols and our programs. We believe the assessment criteria will be effective and can be implemented.
VIII. Concluding remarks

Texas A&M University provides an outstanding intellectual environment for graduate education in forestry and related areas. As part of the large and dynamic Texas A&M University System, our graduate program benefits from this strong statewide and national base and environment of academic excellence. The program is strengthened by interactions within the System including those with the Texas Forest Service, departments within the College of Agriculture and Life Sciences, other TAMU colleges, regional research centers, interdisciplinary faculties, institutes and centers. Our students have access to state of the art facilities and equipment, an excellent library system, and considerable electronic resources. Our graduates receive a solid, broad-based, world-class education and the competitive advantage that comes from study at a major research university.

The strengths of our graduate program are the excellence and diversity of our faculty and their research interests, and the flexibility built into the program. Students can choose a degree and design a program that best meets their career goals. The quality of the program is reflected in the positions our graduates find in the highly competitive academic and industrial job markets. The graduate program is relatively small. The ratio of graduate students to faculty is very good, and students benefit from the corresponding relationships with their advisor and advisory committee. In addition, our department offers a student-friendly environment. Our academic and administrative staff are facilitators who guide, support and encourage and are ready to accommodate student needs.

While our graduate program is strong, we see opportunities to lift it to the next level. One of our goals is to create a critical mass of faculty and students in inter-related subject areas within the Department to improve interaction and provide depth to inquiry based-learning and research. The Tree Improvement, Genetics and Biotechnology program is one area where a critical mass of faculty and students is forming. Our Spatial Sciences program is another. Other areas with potential for growth are: ecology, ecophysiology and global change ecology; wood products, including bioenergy and biobased products; the intersection of forest products expertise with partners in colleges of Business, Engineering and Architecture; urban and community forestry; the human dimensions of forest resources; forest protection; forest fire ecology and management; growth and yield modeling; and international forestry. One of the keys to success in fulfilling this goal will be success in filling current faculty positions. We plan to fill four vacancies in the next couple of years including one each in genomics and population genetics, quantitative genetics, wood products, and hydrology (joint appointment with BAEN).

An increase in assistantships and fellowships would allow us to increase our critical mass of graduate students, and enable us to make further progress on achieving increased gender and ethnic diversity. We must maintain and improve our ability to offer competitive stipends, benefits and tuition waivers. New endowments have allowed us to offer additional fellowships. However, increasing stipend and tuition costs have reduced the total number of assistantships available. Bridging funds are needed to support students between grant funding cycles to allow retention of productive students.
Our challenge for future graduate program growth is to develop new ways to enhance our current academic strengths and to identify new high-impact areas of research and education. One of our goals is to balance departmental focus with interactions in interdepartmental and intercollegiate programs and institutes within the University System, as well as, to enhance international linkages and programs. To offer our students a broad international perspective, we intend to further develop our current cooperation with universities and research institutes in Central and South America, Europe, Australia and New Zealand, and China, and expand opportunities for international student exchanges and studies abroad. We will also expand the effective reach of our graduate education program using technologically assisted teaching methods.

Our history of achievements as a department provides us with a sound and successful base upon which to continue into the future. The Department of Forest Science and its graduate programs serve our society in the Land Grant tradition of working with state and federal agencies, non-governmental organizations, industry and the public. Faculty and students alike are committed to making a major impact on forestry and related renewable natural resources education in Texas, the United States, and the world.
Appendix III-1
Course Sylabbi
FRSC 601 FOREST ECOSYSTEMS AND GLOBAL CHANGE  
Fall 2003 Class Schedule  

Tuesday, Thursday, 9:35 – 10:50 AM  
312 Horticulture/Forest Science Building  

<table>
<thead>
<tr>
<th>Schedule of Topics</th>
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<tbody>
<tr>
<td><strong>Global Change, Biogeochemical Cycles</strong></td>
<td></td>
</tr>
<tr>
<td>Week</td>
<td>Date</td>
</tr>
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<td>1</td>
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<td>Dec 2</td>
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<td>9</td>
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</tbody>
</table>

*Lecture outline may vary from plan. Final exam schedule: Friday, December 12, 12:30-2:30 p.m.*
FRSC 601 FOREST ECOSYSTEMS AND GLOBAL CHANGE
Fall 2003 Syllabus

Tuesday, Thursday, 9:35 – 10:50 AM
312 Horticulture/Forest Science Building

Prerequisites

Approval of instructor

Instructor

Dr. Mark G. Tjoelker
Office: 324 HFSB
Phone: 845-8279
Email: m-tjoelker@tamu.edu

Office Hours

Please feel free to send me email anytime with questions or comments. I will typically reply to email the same day. Alternatively, stop by my office.

Course Description

Through readings, discussions, and essays this course will introduce the critical issues underpinning global change and forest ecology. The course will examine current scientific literature in exploring evidence for human-induced global change and its potential effects on forest and plant communities. The course will examine experimental data and model predictions of responses to global change factors at a range of scales from the leaf level to ecosystem to biome in a wide-range of vegetation types.

Course Objectives
The primary objectives of this course are to:

- To review basic theory and concepts underlying the structure and function of forest ecosystems.
- To explore a range of issues related to global change as they influence forest ecology at multiple scales.
- To gain expertise in evaluating ecosystem responses to a variety of global change factors.
- To learn how to read, interpret, and critically evaluate the primary scientific literature.

**Format**

*Forest Ecology 601* is a 3-credit lecture course. We will explore basic concepts and current topics in forest ecology through assigned readings from the primary literature, classroom discussion, lectures, slide shows, and in-class activities.

**Useful forest ecology textbooks (on 4-hour reserve in Evans Library)**


**Responsibilities and Evaluation**

1) **Required reading**

Each student will be expected to read assigned material before each class period and participate in discussions. Therefore, attendance at all class sessions is expected. The lectures will usually focus on the same topics, but may address either the specific reading or completely different materials, depending on the comprehensiveness or importance of the reading, its difficulty, and the total information that needs to be covered. Therefore, do not assume that materials in the readings will be covered in class. Sometimes they will, sometimes not.

2) **Daily questions**

For each assigned reading, prepare one question or comment. These daily questions or comments should be 1-3 sentences in length, should include your name and be handed in at the start of each class (late submissions lose points). Bring two copies, each on a single sheet of paper, one to hand in. The objectives of these required "daily questions" are:

- to increase the likelihood that required reading will be completed in a timely fashion
- to provide practice at critical thinking
- to give constant feedback on your level of understanding
- to help move classroom focus to issues you find interesting and important
What types of questions?
A good question indicates some depth of thought. A question could be something you don't understand (e.g., "what is soil nitrogen mineralization and why should it vary with nitrogen deposition?") or that seems to contradict something else we've read or covered in lecture (e.g., "how can we reconcile these results with those of Sarah Smith who found opposite results in Borneo?") or something that was not clarified. Comments could for instance, indicate what you think is an important policy implication or linkage to other aspects of forest ecology, public perception, etc.

3) Exams
There will be two short in-class exams. The exam format will likely be short answer and essay questions that will emphasize basic concepts and test your ability to synthesize and evaluate information.

4) Final exam
Format to be discussed.

5) Discussion leader
Each student will be responsible for leading discussions (probably two or three) on papers from the primary literature on topics related to global change. Presentations will take place throughout the course (see handout).

6) Evaluation

<table>
<thead>
<tr>
<th>Course Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daily questions</td>
<td>25</td>
</tr>
<tr>
<td>Two exams</td>
<td>30</td>
</tr>
<tr>
<td>Discussion leader</td>
<td>30</td>
</tr>
<tr>
<td>Final exam</td>
<td>15</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>
SCHEDULE FOR FRSC 602 -- ADVANCED SILVICULTURE

Week 1 -- Discussion of possible course content; Overview of Stand Development Patterns; Temporal and Spatial Patterns of Tree Invasion

Week 2 -- Stand Initiation Stage: Single-Cohort Stands; Stem Exclusion Stage: Single-Cohort Stands, Single-Species Stands

Week 3 -- Stem-Exclusion Stage: Single-Cohort Stands, Mixed-Species Stands; Understory Reinitiation Stage; Old Growth Stage

Week 4 -- Multicohort Stands: Behavior of Component Cohorts; Development of Multicohort Stands

Week 5 -- Stand Edges, Gaps, and Clumps; Quantification of Stand Development

Week 6 -- Forest Ecology and Genetics; Protective Functions of Managed Forests; Protecting Forests Against Damage; Relation of Silviculture to Forest Management

Week 7 -- Clearcutting System; Shelterwood Systems: Uniform System

Week 8 -- Shelterwood Systems: Group System; Irregular System; Strip Systems; Tropical Shelterwood Systems

Week 9 -- Selection System; Group Selection System; Accessory Systems

Week 10 -- Coppice System; Coppice Selection System; Coppice with Standards; Conversion

Week 11 -- Wildlife and Silviculture: Diversity; Species Composition; and Age Structure

Week 12 -- Wildlife and Silviculture: Spatial Heterogeneity; Edges; Islands; Fragments; Shores

Week 13 -- Wildlife and Silviculture: Dying, Dead, and Down Trees; Vertical Structure; Intensive Silviculture; Special Species

Week 14 -- Student Presentations
The Research Process (FRSC 606)
Fall 2003

Instructor:

Dr. Jianbang Gan, Associate Professor
316 Horticulture/Forest Science Bldg.
Phone: 862-4392, email: j-gan@silva.tamu.edu

Schedule:

Class: 10:20-11:10 a.m. MW
Office: MW 1:00-4:00 p.m. or by appointment

Prerequisite:

None

Course Objective:

To introduce students to the philosophy of science and the research process at the graduate level.

Textbooks:


Topics and Assignments:

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Reading</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Overview of the research process</td>
<td></td>
</tr>
</tbody>
</table>

*Philosophy of science*

2-3    Science and scientific discovery

**Identify and discuss 2-3 most important scientific discoveries or technological advances (in your opinion) in your or related field (what, who, when, how, and why)***
*** Students select research topics ***

**Critical thinking**

4 Critical/scientific thinking
Creativity

**Research proposals**

5 Research proposal development
Funding sources

6 Develop summaries of research proposals

*** Summaries of research proposals due ***

7 Presentation and revision of research proposal summaries

**Research practice**

8 Research as a way of knowing

9 Research problems and variables

5

10 Research design

11 Data collection

9

12 Analysis and interpretation
Ethics in science

*** Initial research proposals due ***

13-14 Student-led discussion on forestry and related research
Presentation and revision of research proposals

15 *** Final research proposals due ***

**Grading:**
Students in this course are required to: 1) develop a research proposal and 2) present the research proposal in the class at the end of the semester. Grades will be determined using the following weights and grading scale:

Weights:

| Summary of research proposal | 20% |
| Research proposal           | 50% |
| Class presentation and participation | 30% |

Grading Scale:

A: 90-100%
B: 80-89%
C: 70-79%
D: 60-69%
F: < 60%

All assignments should be turned in at the time specified by the instructor. Late submissions will be discounted at a 25% daily rate. Attendance at each session including lecture, class discussion, and student presentation is expected. Summaries of research proposals, full research proposals, and student presentations will be evaluated by both students and the instructor.

The official regulations concerning incompletes are: “The instructor shall give this grade only when the deficiency is due to an authorized absence or other cause beyond the control of the student.”

Guidelines for Research Proposals:

Research proposals should follow the USDA NRICGP, NSF, or NIH format. The proposal should include a title, a project summary/abstract, and narrative descriptions (background and signification, previous experience/preliminary data, applicant credentials, objectives, hypotheses, specific arms/activities, methodology, expected results, pitfalls and remedies, and completion schedule). Budgets and collaboration arrangements are not required, but welcome. The proposal should be typed and printed on 8.5x11” white paper with 1” margins and appropriate line spacing. Choose a readable type style, preferably 12 point Times Roman. All pages, except the cover, should be numbered consecutively. The description part of the proposal should not exceed 15 pages.

Americans with Disabilities Act (ADA) Statement:

The Americans with Disabilities Acts (ADA) is a federal antidiscrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all
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Texas A&M University Dept. of Forest Science

RENR 444: Remote Sensing in Renewable Natural Resources
FRSC 608: Remote Sensing for Natural Resources Management

Course number RENR 444/FRSC 608
Course date Spring Semester 2004 (Jan. 20, 2004 through May 4, 2004)
Location Lecture: HFSB 105; Lab: Centeq B 214
Meeting day(s) RENR 444 (500) Monday, Wednesday, and Thursday
FRSC 608 (600) Monday, Tuesday, and Wednesday
Meeting time(s) Lectures: MW: 12:40 - 1:30pm
Labs: RENR 444: Thursday, 1:00pm to 3:50pm
FRSC 608: Tuesday, 10:00am to 11:50am

Instructor Information
Name Sorin Popescu
Email s-popescu@tamu.edu
Office location Centeq B 221D
Phone
WebCT page
Office hours
862-2614
https://webct.tamu.edu/ (follow link to Course Listings or use MyWebCT Logon)

Wednesday, 2:00pm-3:00pm. In addition - open door policy, when the
door is open, though I recommend emailing or calling for
appointments. Please put “444” or “608” in the subject of email
messages regarding this class to receive prompt attention. Please avoid
“drop-ins” just before class on Monday and Wednesday.

Teaching Assistant
Hakan Oguz, Ph.D. Candidate, Dept. of Forest Science
hakan@tamu.edu ; Phone: 845-5040
Office hours: Thursday, 4:00pm-5:00pm or by appointment

Course description
Objectives The main objective of this course is to introduce students to the
principles and techniques necessary for applying remote sensing to
diverse issues in natural resources. The course emphasizes a hands-on
learning environment without sacrificing the theoretical and conceptual
underpinnings in both aerial and satellite remote sensing. Primary
focus will be placed on digital image interpretation, analysis, and
processing for a broad range of applications.

Textbooks
Required Introductory Digital Image Processing, A remote Sensing Perspective,
Recommended
supplemental
texts

Remote Sensing of the Environment, An Earth Resource Perspective,
Remote Sensing Digital Image Processing: An Introduction, Richards,

Grading
10 point brakeout system
Lab assignments
Project
Homework
Quizzes
Midterm exam
Final exam
90.0 – 100 = A Excellent
80.0 – 89.9 = B Good
70.0 – 79.9 = C Satisfactory
60.0 – 69.9 = D Passing
00.0 – 59.9 = F Fail
25 % All lab work is due at the beginning of the following lab period
20 %
5 %
5 % Will be administered through webCT
20 % Wednesday, March 3rd
25 % Monday, May 10th, 10:30am – 12:30pm

Important dates
Midterm exam: March 3rd
% of project grade
Project proposal and presentations: March 9 (section 600) 5%
March 11 (section 500)
Project progress report: March 30 (section 600) 10%
April 1 (section 500)
Project paper due: April 20 (section 600) 75%
April 29 (section 500)
Project presentations: April 20 and April 27 (section 600) 10%
April 29 (section 500)
Final exam: May 10th, 10:30am – 12:30pm

Tentative course outline
Week Topic Reading
1 Syllabus; History and future of remote sensing;
electromagnetic spectrum;
Handouts
2 The remote sensing process; RS sensors and data acquisition
Chapter 1 and 2
3 Image statistics, image resolution, data
visualization
Chapter 4 and 5
4 Image preprocessing; Geometric and radiometric correction
Chapter 6
5 Image enhancement; Guest speaker Dr. Ross
Nelson, NASA
Chapter 7
6 Image classification Chapter 8
7 Accuracy assessment, Midterm exam Chapter 8
8 Digital change detection Chapter 9
9 RS applications: vegetation, water, soils, urban Handouts
10 Advanced image processing; GIS Chapters 10
11 Hyperspectral remote sensing Handouts
12 Active sensors: radar Handouts
13 Active sensors: lidar Handouts
14 Final exam review

Tentative laboratory schedule
Week Topic Date
1 Introduction to ENVI, IDL, and ERDAS Imagine, Image display and enhancement, Initial statistics extraction Jan. 20, 22
2 Image preprocessing; geometric and radiometric correction Jan. 27, 29
3 Band rationing, image filtering Feb. 3, 5
4 Principal component analysis Feb. 10, 12
5 Unsupervised classification Feb. 17, 19
6 Supervised classification Feb. 24, 26
7 Accuracy assessment; Project proposals and presentations March 2, 4
8 Spectral change detection; spectral unmixing March 9, 11
9 Project work March 23, 25
10 Introduction to IDL; Project progress reports due March 30, April 1st
11 Introduction to hyperspectral data analysis April 6, 8
12 Introduction to lidar April 13, 15
13 Student project presentations, paper due (section 600), Student project and presentation work (section 500) April 20, 22
14 Student project presentations; paper due section 500 April 27, 29

Laboratory, Homework, and Exam policy
The University policy on Scholastic Dishonesty will be enforced in this course. While you are encouraged to help each other understand concepts and techniques, all work submitted should be your own. Exceptions to this policy will be explicitly noted by the instructor and should not be assumed by students. Make-up exams will not be offered. If you are going to miss an exam for a valid reason (per University rules), contact the instructor well in advance.
All laboratory and homework assignments are to be completed in a neat, logical, and
clear fashion. A 10% reduction in grade, up to a maximum of 50%, will be assessed for each weekday an assignment is handed in late. Assignments will not be accepted if more than 5 weekdays late, unless documented excuse is presented (family or medical emergencies).

**Required materials** for laboratory sessions: CD-ROM disk. **Save** every lab session's work on your network folder and on your CD-ROM! Some assignments will be turned in on CD-ROM.

**Laboratory reports**
Unless otherwise indicated, all laboratory exercises must contain a brief report following the format guidelines given below. The report should be divided into **Introduction, Methods, Results and Discussion, and Conclusions** sections, and should tie together and synthesize the lecture, readings, and practical exercises. A bullet-type format is accepted for students in section 500, but all the report sections mentioned above must be included. Each laboratory exercise will be due the following laboratory period, at the beginning of class, unless otherwise indicated. Instructor may give extra credit to students that

**Projects**
Each student is required to design and implement a class project. The project must use digital image source data and the student must develop a specific output product useful to natural resource managers or researchers. The project is designed to (1) build upon and synthesize techniques or concepts demonstrated in class, and (2) let you explore your own data sets and research objectives using your developing remote sensing "toolkit." Work that contributes to your thesis research or current employment is encouraged (section 600 mainly). Students may write their own image processing software as an integral part of the project; however, a specific (useful) output product must be one result of the project. Consult the instructor regarding acceptable programming languages to be used (C++, IDL, MATLAB, or Visual Basic). Group projects tackling larger research or management issues are encouraged. All projects require instructor approval.

A proposal (150-word maximum) and outline describing the project and **proposed methods** must be turned in by the date indicate in the **Important dates** section. However, students are encouraged to turn in proposals as soon as is feasible. The proposal/outline should contain at least **five** preliminary references (section 600) or **three** preliminary references (section 500). The final report must be no more than twenty pages in length including figures and references, and the final report and summary/outline must follow the format guidelines for papers and laboratory reports. Failure to follow these guidelines will result in the paper not being accepted. The final report must include an **abstract** of no more than 150 **words** that is succinct and informative without reference to the text. This should be followed by the **Introduction, Objectives, Background** (containing a thorough literature review), **Methods, Results and Discussion, and Conclusions**.

Keep in mind that these are semester projects. Laboratory time may be provided for work on your project during the semester, but will be insufficient by itself. A 2-5 page project progress report is required at the start of class as indicated in the **Important dates** section.

Well-chosen student projects may be suitable for **subsequent publication** in either conference proceedings or the peer-reviewed literature. Please keep this goal in mind as you develop and carry out your projects, and particularly as you prepare your
final reports.

**Format Guidelines for Papers and Laboratory Reports**

Papers and lab reports must be double-spaced (using a 12-point proportionally-spaced font) with 1 inch margins all around. Captions, references, footnotes, appendices, tables, etc. may be single-spaced. Figures and tables are encouraged when they serve to illustrate or clarify a point. They should be inserted in the text. Each page following the first full page of text should have a page number in the upper right corner or bottom center. A title page may be supplied; however, reports in special binders of any kind will generally not be accepted. In text citations and references should follow the guidelines for manuscripts submitted for publication to the *American Society of Photogrammetry and Remote Sensing* (http://www.asprs.org/publications.html), for *Photogrammetric Engineering and Remote Sensing* (PE&RS).

Lab reports should be printed on one side of 8.5 by 11 inch white paper. Final projects must be printed using the same criteria. Students are required to keep photocopies and/or electronic copies of all work submitted.

**Aggie Code of Honor**

*Aggies do not lie, cheat, or steal, nor do they tolerate those who do.*

The Aggie Code of Honor functions as a symbol to all Aggies, promoting understanding and loyalty to truth and confidence in each other.

**Prerequisites:** good academic standing

**Americans with Disabilities Act**

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FRSC 614 Economic Analysis for Forest Resource Decisions  
Fall 2004  
Professor:  
Dr. Diana M. Burton, Associate Professor  
Department of Forest Science  
HFSB 308  
979-845-2577 fax: 979-845-6049  
d-burton@tamu.edu  

Catalog Course Description:  
FRSC 614 Economic Analysis for Forest Resource Decisions (3-0) Credit 3. Concepts of managerial economics in forestry, survey of economic analysis and management science techniques to solve forest resource allocation and valuation problems to achieve landowner, investor and social objectives for the ownership, use and management of forestlands.  

Course:  
This course will be offered in Fall 2004 as a graduate distance education course. The course and syllabus are currently under development. Topics will include valuation of natural resources using market and non-market valuation techniques, resource allocation under various management objectives. This goal of this class is to teach students to use economic logic and analysis as a tool to systematically and strategically manage a firm's natural resources. Emphasis will be on applying economic analysis to strategic management decisions which may include selection and evaluation of management objectives across profit, nonmarket values and other ownership ideals; market entry decisions; acquisition and allocation of productive inputs; determination of optimal advertising, pricing and product characteristics for profit; and a examination of forest products, recreation and other markets related to management of natural resource lands. Throughout the class we will focus on developing and using analytical techniques, models and structured frameworks to quantitatively and qualitatively assess criteria for optimal decisions.  
The class will be taught in WebCT Vista. All course materials, in addition to texts and reading, will be on the web. Assignments will be given, turned in and graded on the web. A running web discussion of class material will permit students to develop a fuller understanding of the integrative nature of natural resource management issues and enhance their ability to apply economic and other analytical tools to necessary management decisions.  
Course grades will include exams (given on the web) that focus on application of economic and other tools to management problems, homeworks focusing on written evaluation of problems and assigned readings and a large project involving multiple issues but focused on an area of natural resources of the student's choosing.  

Student Needs:  
All students who have the need for adjustments to enable their learning will be accommodated. The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please
contact the Department of Student Life, Services for Students with Disabilities in Room 126 of the Koldus Building so your professor can best accommodate your needs. The phone number is 845-1637.

**Academic Integrity:**
Academic dishonesty is defined in the TAMU Student Rules and includes getting or providing unauthorized information, answers or questions on assignments or exams, plagiarism, fabrication of information and conspiracy to commit academic dishonesty. Violation of academic dishonesty policies can lead to penalties from a zero on the assignment or an "F" in the course up to and including expulsion from the University. In this course, students may discuss assignments and presentations, but each student must independently write up and submit his own answers or presentations. On exams, no discussion or working together is permitted. Plagiarism, or the use of others' words or work without proper attribution, including course materials or readings, will not be tolerated. Academic dishonesty is a violation of the Aggie Honor Code. A professional's integrity is of critical importance to career and personal success. Do not compromise on integrity, ever.
FRSC 620 Advances and Issues in Forest Science
Spring 2003

Class:
Thursday 2:15 - 3:55 HFSB 124

Professors:
Dr. Mark Tjoelker, Assistant Professor, Department of Forest Science
HFSB 324
979-845-8279
m-tjoelker@tamu.edu
Dr. Diana M. Burton, Associate Professor, Department of Forest Science
HFSB 308
979-845-2577
d-burton@tamu.edu

Office hours:
By appointment. Please feel free to contact us anytime with your questions or comments. Email is the most efficient way of communication and to arrange a convenient time to meet.

Course Objectives: The student will have the opportunity to:
1) understand the scientific context for forestry and to learn to identify, critically read, and evaluate primary scientific literature;
2) understand the social context for forestry and to learn to identify, critically read and evaluate primary social science and policy literature;
3) develop an understanding of current environmental, social and economic issues confronting forested ecosystems;
4) understand the multidisciplinary implications of issues for renewable natural resource management, research and policy; and
5) enhance effective written and oral communication skills needed for scientists and natural resource professionals.

Texts:
This course is divided into segments, each led by a different scientist. Each segment will have a packet of material and selected readings that will be made available to the student. Students will be intensively reading in the primary literature in each scientific area.

Grading:
Research Paper 25 %
Research Paper Presentation 25 %
Journal Article Presentation 20 %
Journal Articles Analysis 20 %
Class Participation 10%

Beyond these specific assignments, guest scientists may assign work. These assignments are required, will be graded and will count as part of the class participation grade.

The research paper and research paper presentation are opportunities to develop a professional quality paper and presentation on a topic of the student's choice. This may be an independent research project, a research proposal, work related to a student's thesis or dissertation or an in depth literature review. Preapproval of the topic by the instructors is required. The presentation will be 30 minutes and the paper should be about 15 pages (more details to follow).

The journal article presentation is a detailed presentation of a scientific work appearing in a peerreviewed journal selected by the student and approved by the instructors. In this presentation, the student
must describe how the work contributes to the scientific field and why it is important to understanding current environmental, social and economic issues confronting forested ecosystems and the multidisciplinary implications of this work for renewable natural resource management, research and policy. The presentation will be 20 minutes. The analysis of journal articles is an essay for which the student is asked to select three papers appearing in scientific journals relating to a current major issue in forest science, such as recent changes in federal forest management or global warming impact on boreal forests. Preapproval of the selected articles by the instructors is required. The student will assess, compare and contrast the papers in terms of 1) the scientific approaches used; 2) hypotheses examined; 3) validity of the methods and techniques to address the hypotheses; 4) the soundness of the conclusions reached by the authors, given their experiments and data; and 5) the relative importance of each paper in the field literature and to forest science in general. The paper should be about 10 pages.

Class participation grade will be based on contributions to the class sessions in furtherance of a lively and informed debate of course materials and issues in forest science. In addition, students may be called upon from time to time, without warning, to provide a synopsis of a selected reading or paper. It is therefore in the student's best interests to read all materials before class and come prepared to discuss or ask pertinent questions. Preparing a written question or comment for each assigned reading will help you formulate your thoughts and in turn help our class discussion by moving the focus toward issues you find interesting and important. There will be no exams. Assignments have specific due dates and times. In fairness to those who are on time with their work, 10% will be deducted from the assignment grade for each 24 hours late. For example, an assignment worth 30% due in class on Thursday and turned in Friday morning will lose 10% of the 30% for lateness.

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Week 1 Class Thursday 1/16
Introduction
M. Tjoelker and D.M. Burton
Week 2 Class Thursday 1/23
Global Change
M. Tjoelker
Week 3 Class Thursday 1/30
Global Change
M. Tjoelker
Week 4 Class Thursday 2/6
Resource Policy Issues
D.M. Burton
Week 5 Class Thursday 2/13
Biotechnology
C. Loopstra
Week 6 Class Thursday 2/20
Debate on Biotechnology
C. Loopstra
Week 7 Class Thursday 2/27
Tree Improvement
T. Byram
Week 8 Class Thursday 3/6
Summary Discussion
Journal Article Presentations (5)
Journal Articles Analysis due in class.
SPRING BREAK! March 10 - 14 Enjoy!
4
Week 9 Class Thursday 3/20
Spatial Sciences
R. Srinivasan
Week 10 Class Thursday 3/27
Spatial Sciences
R. Srinivasan
Week 11 Class Thursday 4/3
Bioenergy
C.T. Smith
Week 12 Class Thursday 4/10
Bioenergy article presentations
C.T. Smith
Week 13 Class Thursday 4/17
Summary Discussion
Research Paper Presentations (3)
Week 14 Class T 4/24
Summary Discussion
Research Paper Presentations (2)
Research Papers due in class.
Syllabus for

Introduction to Tree Improvement

FRSC 430/630 – 3 credit hours

Instructor: Dr. T. D. Byram
E-mail: tbyram@tfs.tamu.edu
Office: Building 1042 Agronomy road
Phone number: (979) 845 2523
URL: Course WWW page:

Required materials:

E-mail account
Access to a computer with Internet, Microsoft office, statistical program (the course will be offered only in an on-line format).

Text books:

Prerequisites:

Requirements include enrollment at Texas A&M University. For those taking the course as an undergraduate elective a minimum of two years undergraduate training in forestry, biology, or closely related field is a prerequisite. For those enrolled at the graduate level, a four-year degree in forestry, biology, or closely related field is required.

Course Objectives:
This course is an introduction to applied tree improvement and is primarily intended for the forestry professional with a desire to make a significant contribution to the scientific management of applied tree breeding programs. This course serves as an introduction to FRSC 633 Forest Genetics for those pursuing an advanced degree with emphasis on forest genetics. This course also serves as an undergraduate elective for those at the junior or senior level with an interest in the topic. This course deals specifically with the treatment of genetic variation in forest trees and its use in plant breeding programs. The course will provide students with foundation knowledge essential to the understanding of principles of tree improvement.

The specific learning objectives of the course are to:
1. acquire an understanding of the principles and practice of tree improvement,
2. be familiar with examples of tree improvement programs, 
3. be exposed to current developments in tree improvement, 
4. learn how to design and monitor a tree improvement program.

**Course Schedule:**

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
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<tbody>
<tr>
<td>1</td>
<td>Course introduction</td>
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<tr>
<td>1</td>
<td>Geographic variation and its use</td>
</tr>
<tr>
<td>2</td>
<td>Testing species and provenances</td>
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<td>2</td>
<td>Matching species to sites</td>
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<td></td>
<td><strong>Problem set # 1</strong></td>
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<tr>
<td>3</td>
<td>Reproductive biology of pines</td>
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<td>3</td>
<td>Tree breeding cycle</td>
</tr>
<tr>
<td>4</td>
<td>Breeding objectives</td>
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<td>4</td>
<td>Selection criteria</td>
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<td>5</td>
<td>Selection methods</td>
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<td>5</td>
<td>Controlled pollination</td>
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<td>6</td>
<td>Mating designs</td>
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<td>7</td>
<td>Progeny testing</td>
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<td></td>
<td><strong>Mid-term</strong></td>
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<tr>
<td>8</td>
<td>Seed Orchard Establishment</td>
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<td>8</td>
<td>Seed Orchard Management</td>
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<tr>
<td>9</td>
<td>Breeding strategies</td>
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<td>9</td>
<td>Advanced generation selection</td>
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<td></td>
<td><strong>Problem set # 2</strong></td>
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<td></td>
<td>Special topics</td>
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<tr>
<td>10</td>
<td>Early testing / Indirect Selection</td>
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<tr>
<td>11</td>
<td>Disease resistance</td>
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<tr>
<td>11</td>
<td>Drought resistance</td>
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<tr>
<td>12</td>
<td>Wood density</td>
</tr>
<tr>
<td>12</td>
<td>Hybrids / Clones</td>
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<tr>
<td>13</td>
<td>Genetic resource conservation</td>
</tr>
</tbody>
</table>

*Tree breeding examples (Pine, Eucalypts)*

### Deployment Strategies

### Review

### Final Exam

**Grades:**
Grades for the course will be determined by the quality and completeness of assignments. Specific assignments will be made as the class progresses; these will include two problem sets, a tree improvement prospectus and two examinations. All students will be required to read and participate in on line discussions of three sets of articles illustrating current thought on tree breeding fundamentals (articles to be provided). Those students enrolled for graduate level credit will facilitate and summarize the discussion. The tree improvement prospectus will be a semester long project that for the undergraduate student will require the development of an annual plan of work for an appropriate tree improvement problem (to be agreed upon with the instructor). The graduate level student will be required to support the annual plan of work with a discussion of tree breeding goals to include species selection, selection criteria, breeding objectives, and appropriate strategies. The completeness of the literature review and development of ideas will be considered. Problem sets are designed to monitor student progress and the general understanding of the taught materials.

Assignment percent of grade will be as follows:

- Problem sets (2)  20%
- Project  25%
- Mid-term exam  25%
- Final exam  30%

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arm) or permanent (including a learning disability), please contact the Office of Support Services for Students with Disabilities in room 216 of the Koldus Building (phone number: 845 1637).
Forest Genetics

FRSC 632 – 3 credit hours

Instructor: Dr. T. D. Byram
E-mail: tbyram@tfs.tamu.edu
Office: Building 1042 Agronomy road
Phone number: (979) 845 2523
URL:
Course WWW page:

Required materials:
E-mail account
Access to a computer with Internet, Microsoft office (the course will be offered only in an on-line format).

Text books:


Prerequisites:

Requirements include enrollment at Texas A&M University. This is a graduate level course. Prerequisite is a BSc in forestry, biology and any other closely related field and completion of FRSC 430/630. This course is intended to be an extension of the Introduction to Tree Improvement Course (FRSC 430/630).

Course Objectives:
The course is designed for practicing tree improvement professionals with degrees in forestry or a closely related field and a desire to make a more significant contribution to the scientific management of applied tree breeding programs. This course provides a statistical and theoretical basis for managing the scientific aspects of a tree improvement program and provide an introduction to the scientific literature. This course builds on the introduction to Tree Improvement course. The specific learning objectives of the course are to:

1. acquire a broad understanding of the genetic architecture of quantitative traits of forest trees,
2. be able to design genetic tests and estimate genetic parameters,
3. be able to propose and evaluate possible methods to solve genetic problems in a
4. be exposed to current statistical tools and new developments in forest genetics.

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td><em>Course introduction</em></td>
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<tr>
<td>1</td>
<td>Genetic principles (nature and transmittal of genetic material)</td>
</tr>
<tr>
<td>2</td>
<td>Population genetics (H-W, mutation, selection, migration, drift)</td>
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<tr>
<td>3</td>
<td><em>Continuous variation, Genetic values and means</em></td>
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<tr>
<td>3</td>
<td>Statistics I (means, variances, test for normality, t-test, ANOVA)</td>
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<tr>
<td>4</td>
<td><em>Statistics II (Chi-square, Correlation and regression)</em></td>
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<tr>
<td>4</td>
<td><em>Problem set # 1</em></td>
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<tr>
<td>5</td>
<td>Genetic variances</td>
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<tr>
<td>6</td>
<td><em>Resemblance between relatives and heritability</em></td>
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<tr>
<td>6</td>
<td>Correlated traits (trait-trait, age-age)</td>
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<tr>
<td>7</td>
<td>Use of some statistical packages (variance components, heritability)</td>
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<tr>
<td>7</td>
<td>Use of some statistical packages (correlations)</td>
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<tr>
<td>8</td>
<td><em>Problem set # 2</em></td>
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<tr>
<td>8</td>
<td>Selection using information from relatives</td>
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<tr>
<td>8</td>
<td>Inbreeding and crossbreeding</td>
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<td>9</td>
<td>Mid-term exam</td>
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<tr>
<td>9</td>
<td>Genotype x Environment interactions</td>
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<tr>
<td>10</td>
<td>Use of some statistical packages (GxE)</td>
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<tr>
<td>10</td>
<td>Gain calculation (CGPs)</td>
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<tr>
<td>11</td>
<td>Early selection (selection efficiency, optimum age of selection)</td>
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<tr>
<td>11</td>
<td>Use of some statistical packages (Gain, CGPs, efficiencies of selection)</td>
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<tr>
<td>12</td>
<td><em>Scale effects and threshold traits</em></td>
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<tr>
<td>13</td>
<td>Quantitative trait loci (QTLs) / Marker assisted selection</td>
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<tr>
<td>14</td>
<td>Major genes</td>
</tr>
<tr>
<td>14</td>
<td>Cloning</td>
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<tr>
<td>Project</td>
<td>Final Exam</td>
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</table>

**Grades:**
This is a graduate level course. The desired outcome is the growth of the individual student. Grades for the course will be determined by the quality and completeness of assignments. Specific assignments will be made as the class progresses; these will include two problem sets, a project and two examinations. The project is aimed at developing the key analytical skills essential for research in Forest Genetics. Hence, the project will involve analysis and interpretation of real forest genetic data (data to be provided). The project will be presented in the format of a research article. The project should not exceed 3000 words in length. The project must be submitted electronically. Relevant citations must be included in a reference list as appropriate. Problems and tests are designed to monitor student progress and the understanding of the taught materials. Furthermore, all students will be required to read and participate in online discussions of three sets of articles illustrating current thought on Forest Genetics (articles to be provided).

Assignment percent of grade will be as follows:

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Problem sets (2)</td>
<td>20%</td>
</tr>
<tr>
<td>Project</td>
<td>25%</td>
</tr>
<tr>
<td>Mid-term exam</td>
<td>25%</td>
</tr>
<tr>
<td>Final exam</td>
<td>30%</td>
</tr>
</tbody>
</table>

Students will be held accountable on exams for all course material covered in texts, problem sets and web discussions.

**Texas A&M Services for Students with Disabilities: (845-1637):**
The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, either temporary (e.g. broken arm) or permanent (including a learning disability), please contact the Office of Support Services for Students with Disabilities in room 216 of the Koldus Building (phone number: 845 1637).
Syllabus for
Plant Functional Ecology
FRSC 634 – 2 Credit hours

Instructor
Dr. Mark G. Tjoelker
E-mail: m-tjoelker@tamu.edu
Phone: 845-8279
Office: 324 Horticulture/Forest Science Building (HFSB)

Office Hours
Please feel free to send me email anytime with questions or comments or to arrange a meeting. I will typically reply to email the same day.

FRSC 634, Plant Functional Ecology, (2-0) Credit 2. I. An advanced study of plant ecology and physiology with emphasis on the relationship of woody plants to the environment in both ecological and evolutionary contexts. Prerequisites: RENR 205 or MEPS 313 or equivalent; graduate classification.

Objectives
The primary objectives of this course are:
- To understand the theory and concepts underlying plant function in relationship to morphological and physiological traits, including the role of adaptation and acclimation in traits in ecological and evolutionary contexts.
- To link physiological processes at a range of scales from leaf to canopy to stand.
- To examine tree response to environmental variation and global change drivers.
- To read, interpret, and critically evaluate primary scientific literature.

Format
Plant functional Ecology is a 2-credit lecture and web-based course. Through weekly readings, discussions, and presentations this course will introduce the key theories, concepts, and observations in woody plant physiological ecology. We will examine current scientific literature in exploring the mechanisms underpinning ecological patterns and consequences for forest trees, stands, and ecosystems. We will explore the methods and techniques used to address critical hypotheses in plant physiological ecology.

Recommended texts
In addition to assigned readings, the following texts are recommended:


Course Outline:

Week(s)  Schedule of Topics

1-3  What is plant physiological ecology? Ecological and evolutionary perspectives.
4-6  Relative growth rate: A search for causes and consequences
7    Midterm
8-9  Principles of photosynthesis and respiration: defining trade-offs.
10-11 Water relations: How do trees defy gravity?
12-13 Plastic plants? The role of acclimation and adaptation in physiological traits
14-15 Canopy structure: scaling leaf function from leaf to globe

Responsibilities and Evaluation

1) **Required reading**
   
   Each student will be expected to read assigned material (papers from the primary scientific literature) before each class period and participate in discussions. The lectures or supplementary materials posted will usually focus on the same topics, but may address either the specific reading or completely different materials, depending on the comprehensiveness or importance of the reading, its difficulty, and the total information that needs to be covered.

2) **Weekly discussion forum**
   
   For each assigned reading, prepare one question or comment. These questions or comments should be 1-3 sentences in length. Your question and comment will be posted to our course website to facilitate discussion. In addition to posting your question, you are also required post a written response to at least one other question or comment posted by your classmates. The objectives of these required "weekly questions" are:
   
   - to increase the likelihood that required reading will be completed in a timely fashion
   - to provide practice at critical thinking
   - to give constant feedback on your level of understanding
   - to help move discussion focus to issues you find interesting and important

3) **Discussion leader**
   
   Each student will be responsible for selecting and leading discussions (probably two or three) on papers from the primary literature on topics related to woody plant physiological ecology. Presentations will take place weekly throughout the course (see separate handout). Students will be required to post their presentations as an annotated Powerpoint presentation

4) **Exams**
   
   There will be two exams: a midterm and final. The exam format will be short answer essay questions that will emphasize basic concepts and test your ability to synthesize and evaluate information.
5) Evaluation

<table>
<thead>
<tr>
<th>Course Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weekly discussion forum</td>
<td>45</td>
</tr>
<tr>
<td>Discussion leader</td>
<td>25</td>
</tr>
<tr>
<td>Two exams</td>
<td>30</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Course Policies

Late assignments. Credit on late assignments will be granted only for excused absences.

Course incompletes. The official regulations concerning incompletes are: "The instructor shall give this grade only when the deficiency is due to an authorized absence or other cause beyond the control of the student."

Promoting academic integrity. Scholarship depends upon open and honest inquiry. Students have an ethical and moral responsibility to avoid cheating and to help prevent others from cheating. Texas A&M University encourages academic integrity and strictly enforces policies against any form of scholastic dishonesty. The Texas A&M University Student Rules defines five forms of academic dishonesty: 1) acquiring information, 2) providing information, 3) plagiarism, 4) conspiracy, and 5) fabrication of information. Please review the Student Rules at http://student-rules.tamu.edu/for more information regarding these policies. Sanctions range from grade penalties (e.g. 0 on an assignment) to expulsion from the University.

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact the Office of Support Services for Students with Disabilities in Room 126 of the Koldus Student Services Building. The phone number is 845-1637.
Syllabus for Forest Biotechnology
FRSC 635 – 2 Credit hours

Instructor: Dr. Carol Loopstra
E-mail: c-loopstra@tamu.edu
Office: 124A Norman E. Borlaug Center for Southern Crop Improvement
Phone number: (979) 862-2200
URL:
Course WWW page:

Required materials:
E-mail account
Access to a computer with Internet and Microsoft office (the course will be offered only in an on-line format).

Text books:
There is no required textbook. Students will be required to read a collection of journal articles and access web sites.

Prerequisites:
Requirements include enrollment at Texas A&M University. A four-year degree in forestry, biology, or closely related field is required. An undergraduate course in biology is required. A class in genetics is preferred.

Course Objectives:
1) To familiarize students with techniques and concepts important for modifying plants through biotechnology.
2) To familiarize students with the current status of forest biotechnology and the published literature.
3) To enable students to critically evaluate claims and criticisms regarding genetically modified crops.

Topics Covered:
<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Course Introduction and Organization</td>
</tr>
<tr>
<td>1</td>
<td>DNA Structure and Organization</td>
</tr>
<tr>
<td>2</td>
<td>Techniques in Biotechnology</td>
</tr>
<tr>
<td>3</td>
<td>Gene Isolation</td>
</tr>
<tr>
<td>4</td>
<td>Gene Characterization</td>
</tr>
<tr>
<td>5</td>
<td>Mapping and Marker Aided Selection</td>
</tr>
<tr>
<td>6</td>
<td>Map Based Cloning</td>
</tr>
<tr>
<td>6</td>
<td>Genomics and Forest Trees</td>
</tr>
<tr>
<td>7</td>
<td>Transformation methods</td>
</tr>
<tr>
<td>7</td>
<td>Somatic Embryogenesis</td>
</tr>
<tr>
<td>8</td>
<td>Wood Development - Background</td>
</tr>
<tr>
<td>9</td>
<td>Genetic Engineering of Wood</td>
</tr>
<tr>
<td>9</td>
<td>Tree growth and form</td>
</tr>
<tr>
<td>10</td>
<td>Flowering - Proposal outlines due!</td>
</tr>
<tr>
<td>11</td>
<td>Genetic Engineering for Insect Resistance</td>
</tr>
<tr>
<td>11</td>
<td>Genetic Engineering for Herbicide Resistance</td>
</tr>
<tr>
<td>12</td>
<td>Genetic Engineering for Disease Resistance - Proposals due!</td>
</tr>
<tr>
<td>13</td>
<td>Genetic engineering for Stress Resistance/ Bioremediation</td>
</tr>
<tr>
<td>14</td>
<td>Bioethics</td>
</tr>
</tbody>
</table>

Grades:
Assignment percent of grade will be as follows:

**Project** 30%

**Mid-term exam** 30%

Final exam 30%
Participation in discussions 10%

**Project:** The students will develop a research proposal covering an area of interest in forest biotechnology. Projects may be for basic or applied research. Potential funding sources will be identified. The proposal will include sections on relevance, background, an experimental plan, and literature cited. The proposals will be available to all students.
via the course web site. All students will review the proposals and make comments.

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**Promoting academic integrity**

*As commonly defined, plagiarism consists of claiming the ideas, words, writings, etc, of another person as your own work. This means you are committing plagiarism if you copy work of another person and turn it in as your own, even if you should have the permission of that person. Plagiarism is one of the worst academic sins, for the plagiarist destroys the trust among colleagues without which research cannot be safely communicated. If you have any questions regarding plagiarism, please consult the latest issue of the Texas A&M University Student Rules, under the section "Scholastic Dishonesty."*
Syllabus for

Forest Genetics Practicum

FRSC 636 – 3 credit hours

Instructor: Dr. T. D. Byram
E-mail: tbyram@tfs.tamu.edu
Office: Building 1042 Agronomy road
Phone number: (979) 845 2523
URL: 
Course WWW page:

Required materials:
E-mail account

Text books:

Relevant reading material will be assigned as needed and related to the course material being covered.

Prerequisites:

Requirements include enrollment at Texas A&M University. This course is intended to give students experience in applied tree improvement. Thus the Introduction to Tree Improvement (FRSC 430/630), Forest Genetics (FRSC 632), Tree Physiology (FRSC 634), and Forest Biotechnology (FRSC 635) are prerequisites for this course.

Course Objectives:
This class would consist of a four-week session offered in January/February that would include practical experience with tree improvement techniques including pollen collection, control pollination methods, field test establishment, and orchard establishment and management. The specific learning objectives of the course are to have ‘hands-on’ practical experience in tree improvement activities. Students will be exposed to some practical aspects of tree physiology and forest biotechnology.
Course Schedule:

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><em>Pollen collection &amp; storage</em></td>
</tr>
<tr>
<td>1</td>
<td>Control pollination</td>
</tr>
<tr>
<td>1</td>
<td><em>Seed collection &amp; extraction</em></td>
</tr>
<tr>
<td>1</td>
<td>Nursery management</td>
</tr>
<tr>
<td>1</td>
<td>Field test establishment</td>
</tr>
<tr>
<td>2</td>
<td>Orchard establishment</td>
</tr>
<tr>
<td>2</td>
<td>Orchard management</td>
</tr>
<tr>
<td>2</td>
<td>Grafting</td>
</tr>
<tr>
<td>2</td>
<td><em>Seed collection and storage</em></td>
</tr>
<tr>
<td>3</td>
<td>Physiology (<em>measurement of drought resistance, photosynthesis, etc.</em>)</td>
</tr>
<tr>
<td>3</td>
<td>Cloning (tissue culture, somatic embryogenesis, etc.)</td>
</tr>
<tr>
<td>3</td>
<td>Markers (linkage and QTL mapping)</td>
</tr>
<tr>
<td>3</td>
<td>Biotechnology</td>
</tr>
<tr>
<td>4</td>
<td><strong>Seed testing</strong></td>
</tr>
<tr>
<td>4</td>
<td>Measuring growth, form and disease</td>
</tr>
<tr>
<td>4</td>
<td>Wood density determination</td>
</tr>
</tbody>
</table>

Grades:
Grading will rely heavily on site evaluation of students. Thus, grades will be strongly influenced by being an active participant in the learning process. In addition, professional behavior affects grading in this practicum. For example, lateness and missing sessions will lower the grades. Grades will thus be based upon student field attendance, and any judgement by the supervisor of the student's performance in the field.

Evaluation will be as follows:

A   Excellent competence
B   Good competence or good effort
C   Marginal competence
F   Unsatisfactory performance (fail)
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FRSC 640 - Arboriculture

Spring 2004 Syllabus and Class Policies

Class
MW 10:20-11:10, 101 HFSB

Additional lecture time TBA
M 1:00-2:50 (lab), 126 HFSB and TAMU Horticultural Gardens

Professor
Dr. W. Todd Watson
Assistant Professor of Urban and Community Forestry
Department of Forest Science, 323 HFSB
Off. 458-1753 (yes, I have 24-hour voice mail)
Hm. 693-0248 (emergencies only and not before 7:00 am or after 9:00 pm)
t-watson@tamu.edu

Office Hours
MW 11:10-12:00 and by appointment (except the hour preceding class)

Course Objectives
Arboriculture deals with the care of trees. In its broadest sense, arboriculture includes shade trees, ornamental trees, food trees, timber trees, and amenity trees. This course deals more specifically with trees in urban areas. Shade trees are the largest living organism in the urban landscape and therefore have high economic, ecological, and social values for urban dwellers. Because of this, a great amount of effort is expended to care for urban and community trees. This course is designed to give students the opportunity to:

1. learn new and better ways to help trees stay healthy, safe, and attractive,
2. learn how trees grow, defend themselves, and eventually die,
3. learn how to determine the compensatory values of trees,
4. understand legal, ethical, and business issues associated with urban trees,
5. be introduced to arboricultural equipment and safety practices, and
6. develop professional skills and standards of excellence that will be invaluable in your professional careers.

Texts


Selected readings at West Campus Library and on the class website

Selected websites

Required Materials

E-mail account (active throughout the semester)

Access to the WWW

Access to a computer with Word, Word Perfect, or other word processing software

Enrollment on class website at http://groups.yahoo.com/group/FRSC689A/

Additional Reading

Additional readings will be provided throughout the semester to supplement lectures and required readings. All additional hard-copy texts and readings will be on reserve at the West Campus Library and/or sent to all students via the class website.

grade criteria

<table>
<thead>
<tr>
<th>Category</th>
<th>Points</th>
<th>% of grade</th>
<th>Grading</th>
</tr>
</thead>
<tbody>
<tr>
<td>Three Exams and One Final Exam (highest three grades)</td>
<td>300</td>
<td>30%</td>
<td>900-1000 = A</td>
</tr>
<tr>
<td>Ten Lab Quizzes</td>
<td>120</td>
<td>12%</td>
<td>800-899 = B</td>
</tr>
<tr>
<td>Field Trip</td>
<td>80</td>
<td>8%</td>
<td>700-799 = C</td>
</tr>
<tr>
<td>Lab Practical</td>
<td>100</td>
<td>10%</td>
<td>600-699 = D</td>
</tr>
<tr>
<td>Written Report</td>
<td>100</td>
<td>10%</td>
<td>&lt;600 = F</td>
</tr>
<tr>
<td>Research Article Summaries (10 summaries)</td>
<td>100</td>
<td>10%</td>
<td></td>
</tr>
<tr>
<td>Current Research Presentation</td>
<td>100</td>
<td>10%</td>
<td></td>
</tr>
<tr>
<td>Class Participation</td>
<td>100</td>
<td>10%</td>
<td></td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>1,000</strong></td>
<td><strong>100%</strong></td>
<td></td>
</tr>
</tbody>
</table>
Students will be accountable on exams for all course materials covered in lectures, guest lectures, texts, additional reading, web pages, and field trip. The final exam will be cumulative. Students will be allowed to drop their lowest exam grade. Students that have taken the first three exams and are satisfied with their grade for the course are not required to take the final exam. In order to be fair to all students, final grades may be curved up. Grading criteria will follow policies outlined in Texas A&M University Student Rules (see http://student-rules.tamu.edu/). There is no outside/extra work for extra credit; however, bonus points may be included on lecture and lab assignments.

MAKE-UP Assignments:

Make-up assignments will follow policies outlined in Texas A&M University Student Rules (see http://student-rules.tamu.edu/). It is the student’s responsibility to read and follow the Student Rules. Make-ups will be given only for acceptable, excused absences on the official University list, and I must be notified in advance of the absence (e.g. email, voice mail, written note) or by the end of the next working day after the absence in cases of emergencies. Any assignment missed without following the Student Rules will result in you receiving a grade of 0 (unless there are extraordinary extenuating circumstances, and in such cases you must appeal directly to me). If this is your first 0 on an exam, then it will automatically be your dropped grade, and you will be required to take the final (unless the final is the only exam missed). If you have already used your drop grade, then the 0 will be averaged as a grade. The make-up exam will be tentatively scheduled at the time I grant the excuse, and will be within the time frame based on your excuse. If the make-up exam is taken after the exams have been returned in class, then a different but comparable make-up exam will be given.

Class Website

Lecture notes, study questions, helpful websites, project guidelines, syllabus, and other helpful information will be posted on the Yahoo website to assist you in performing well in this class. The website contains a message board that allows you to ask questions of the class or me. In addition, there is a chat room that you are welcome to use to meet with other students and study for the exam or ask questions. The website contains a calendar that will notify you of important assignments that are outlined in the syllabus. The website will notify you of any changes that I make to the website. It is your responsibility to sign into the website (at the URL provided above) to stay current with project assignments and other useful information. If you are having trouble logging in, please let me know.

I will also post your grades on the website by the five digit number of your choosing. You will be given the option on the first exam to decide whether you want your grades posted and the identification number that you want to use. Grades will be posted as quickly as reasonably possible. All grades posted to the web should be considered as unofficial. In addition, you class participation grade will not be posted on the web because of the possibility of someone associating your identification number with you. The information on the website is not available for public access. My authorization is required before anyone is allowed to join the website group and view any of the
information contained therein. Please meet with me personally for detailed information about your grade.

WRITTEN report

A class project will be assigned to introduce students to some of the skills required of an arborist. Students will be required to evaluate the health of a tree. The final report for this project will be a written document similar to the type that an arborist would provide to a client. In the career world, written and oral skills are as valuable as an understanding of the specific discipline. Instructions will be given out later in the semester outlining specific requirements for the project. Reports that are late will be dropped a full letter grade for each 24-hour period that they are late. For example, if a report is due at 5:00 and is turned in at 5:01, it will be dropped a full letter grade. If it is turned in after 5:00 on the next day, it will be dropped two letter grades. If you need help with your writing skills, the Texas A&M University Writing Center can provide assistance (see http://uwc.tamu.edu/).

CURRENT research discussions

Every week, several papers (journal articles, book chapters, etc.) will be evaluated based on a critical review of current research literature on an arboriculture topic. Each student will be required to give two short, oral presentations during the semester that are comprehensive overviews of one of the selected research projects. For the presentations, students will be allowed to select a research topic from those listed throughout the semester on the syllabus or other arboriculture topic approved by the instructor. This section will function as a seminar giving students the opportunity to practice for future scientific presentations while learning the latest scientific findings on an arboriculture topic.

This portion of the class is designed to encourage students to review all scholarly articles presented and engage in thoughtful, classroom discussions of all topics. Students will be responsible for preparing 3 thoughtful and intelligent discussion questions for the selected article(s) each week to be turned in at the beginning of class the day that the topic is discussed. The grade value of questions will be determined by dividing 100 points by the number of presentations. For example, if there are 10 students presenting (2 presentations each), then questions will be worth 1.67 points each or 5 points for each set of questions. Questions turned in late will not be accepted. In addition, students will submit PowerPoint presentations of research presentations to the instructor at the time of presentation.

Field Trip

A field trip will be required to learn practical, “hands-on” information about arboriculture from professional arborists. The date and location of the field trip will be announced later in the semester. All students are expected to attend the field trip. Students who cannot attend the field trip will be required to turn in a five-page review paper on a selected arboricultural topic of my choosing.
Attendance Policy

The university views class attendance as an individual student responsibility, however, attendance is expected. The class participation grade will be based on class attendance and discussion. Therefore, good attendance will help those students with borderline grades. Material will be covered in class lectures that are not in the assigned readings. Students interested in learning the course material are strongly encouraged to attend class regularly and participate in class discussions. Active learning is more effective than passive learning. Class attendance will be monitored and recorded as part of your grade. After you graduate, attendance at your job will be mandatory.

Academic Honesty and Integrity

The Aggie Code of Honor states: “Aggies do not lie, cheat, or steal, nor do they tolerate those who do.” This includes not only cheating on exams but also plagiarism, which is stealing and passing off the ideas, words, writings, etc. of another as one’s own. Because I am an old Ag, I hold the Aggie Code of Honor in high regard. Those who violate this code by cheating or plagiarizing the work of others will be dealt with severely. If I have reason to suspect a student of cheating, but cannot prove it, I reserve the right to require the student to take a make-up exam. I can only help you if I know that it is your own work. Further information concerning scholastic dishonesty and plagiarism can be found in the current edition of the Texas A&M University Student Rules (see http://student-rules.tamu.edu/).

Class demeanor

It is the responsibility of Texas A&M University to provide a learning environment, and it is the responsibility of the students to respect the rights of others. Disrupting class is more than discourteous; it is a violation of Texas A&M’s policy (see http://student-rules.tamu.edu/). Out of respect for the other students, the instructor, and university regulations, electronic communication devices, such as beepers and cell phones, must be inactive during class time. Violation of this policy will result, at minimum, in the student being asked to leave the class. Similarly, other types of disruptions that interfere with the opportunity for others to learn, such as conversation, snoring, music, or riffling through the latest issue of the Battalion during the lecture will not be tolerated.

Learning assistance

I always welcome the opportunity to assist students interested in learning about arboriculture. I will try to use several teaching and testing methods to accommodate the varied learning styles of the students in class, and I make it a point to be very approachable outside of class. I am also very interested in positive and negative feedback that will help me to improve the course or my teaching style. Interaction between teachers and students is a very powerful way of learning information. Office hours are set aside for this purpose as well as other times by appointment. You can also leave me a note, call me, or send email. Because Texas A&M sets the standard for professionalism, please review the textbook and additional readings first before asking questions. This
technique will serve you well in your professional careers. Out of fairness to all students, I never make my lecture notes available other than what is passed out in class or posted on the class website, so it is your responsibility to obtain additional notes from a classmate. My goal is to motivate and challenge you intellectually while providing instructional support, so if you are having a difficult time grasping the material, please let me know. It is your responsibility to let me know if you need help!

DISABILITIES

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring accommodation, please contact the Office of Support Services for Students with Disabilities in room 216 of the Koldus Building. The phone number is 845-1637.

2004 Lecture Schedule*

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Topic</th>
<th>Textbook</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>W 1/21</td>
<td>Housekeeping</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>M 1/26</td>
<td>Tree Biology, Physiology, and Tree Defenses</td>
<td>Chapter 2</td>
</tr>
<tr>
<td></td>
<td>W 1/28</td>
<td>Tree Biology, Physiology, and Tree Defenses cont.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TBA</td>
<td>Introduction to Urban Forestry Research</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>M 2/2</td>
<td>Guest Lecturer (topic to be determined)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>W 2/4</td>
<td>Guest Lecturer (topic to be determined)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TBA</td>
<td>Arboriculture Research Article Presentations, Questions Due</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>M 2/9</td>
<td>Tree Biology, Physiology, and Tree Defenses cont.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>W 2/11</td>
<td>Tree Biology, Physiology, and Tree Defenses cont.</td>
<td></td>
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<tr>
<td></td>
<td>TBA</td>
<td>Arboriculture Research Article Presentations, Questions Due</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>M 2/16</td>
<td>Principles of Tree Pruning</td>
<td>Chapter 14</td>
</tr>
<tr>
<td></td>
<td>W 2/18</td>
<td>Principles of Tree Pruning cont.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TBA</td>
<td>Arboriculture Research Article Presentations, Questions Due</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>M 2/23</td>
<td>EXAM #1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>W 2/25</td>
<td>Tree-Soil Relations</td>
<td>Chapters 4 &amp; 7</td>
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<tr>
<td></td>
<td>TBA</td>
<td>Arboriculture Research Article Presentations, Questions Due</td>
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</tr>
<tr>
<td>7</td>
<td>M 3/1</td>
<td>Tree-Soil Relations cont.</td>
<td>Chapters 4 &amp; 13</td>
</tr>
<tr>
<td></td>
<td>W 3/3</td>
<td>Water Management</td>
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<td></td>
<td>TBA</td>
<td>Arboriculture Research Article Presentations, Questions Due</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>M 3/8</td>
<td>Tree Nutrition and Fertilization</td>
<td>Chapter 12</td>
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<tr>
<td></td>
<td>W 3/10</td>
<td>Tree Nutrition and Fertilization cont.</td>
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<td>Arboriculture Research Article Presentations, Questions Due</td>
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<tr>
<td>9</td>
<td>M</td>
<td>Spring Break! ☀</td>
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<tr>
<td>10</td>
<td>M 3/22</td>
<td>Tree Planting</td>
<td>Chapters 5-6 &amp; 8-10</td>
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<tr>
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<td>W 3/24</td>
<td>Tree Planting</td>
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<td>TBA</td>
<td>Arboriculture Research Article Presentations, Questions Due</td>
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44
### 2004 LAB SCHEDULE

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>M 1/26</td>
<td>Arboriculture Equipment and Safety</td>
</tr>
<tr>
<td>3</td>
<td>M 2/2</td>
<td>Tree Climbing Techniques</td>
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<tr>
<td>4</td>
<td>M 2/9</td>
<td>Tree Biology, Quiz 1</td>
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<tr>
<td>5</td>
<td>M 2/16</td>
<td>Tree Pruning, Quiz 2</td>
</tr>
<tr>
<td>6</td>
<td>M 2/23</td>
<td>Tree Support Systems, Quiz 3</td>
</tr>
<tr>
<td>7</td>
<td>M 3/1</td>
<td>Urban Soils and Water Relations, Quiz 4</td>
</tr>
<tr>
<td>8</td>
<td>M 3/8</td>
<td>Tree Nutrition and Fertilization, Quiz 5</td>
</tr>
<tr>
<td>9</td>
<td>M 3/15-F 3/19</td>
<td>Spring Break!  🎉</td>
</tr>
<tr>
<td>10</td>
<td>M 3/22</td>
<td>Tree Selection, Installation, and Establishment, Quiz 6</td>
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<tr>
<td>11</td>
<td>M 3/29</td>
<td>Lightning Protection Systems, Quiz 7</td>
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<tr>
<td>12</td>
<td>M 4/5</td>
<td>Guest Lecturer (topic to be determined), Quiz 8</td>
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<tr>
<td>13</td>
<td>M 4/12</td>
<td>Tree Health Diagnosis, Quiz 9</td>
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<tr>
<td>14</td>
<td>M 4/19</td>
<td>Tree Hazard Assessment, Quiz 10</td>
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<tr>
<td>15</td>
<td>M 4/26</td>
<td>LAB PRACTICAL</td>
</tr>
<tr>
<td>16</td>
<td>M 5/3</td>
<td>Redefined Day, Treevia</td>
</tr>
</tbody>
</table>

Additional reading assignments for each topic covered in lecture are on Reserve in the West Campus Library.
* I reserve the right to make reasonable changes (with prior notice) to the topics and reading assignments outlined in the course schedule to accommodate guest lecturers and to improve the course content and learning opportunity for the students.

GOOD LUCK AND BEST WISHES FOR A SUCCESSFUL SEMESTER!

Acknowledgment of the terms of FRSC 640 Arboriculture as stated in the preceding Spring 2004 Syllabus and Class Policies

I, the undersigned, acknowledge that I have read and understand the terms of this FRSC 689 course syllabus and class policies (as stated in the preceding 6 pages) and that I agree to abide by the terms of this document. All terms of this document are subordinate to published TAMU policies and all federal, state, and local laws and ordinances. I understand that this signed agreement must be turned in prior to the first exam to verify my acceptance of the terms.

________________________________________
Printed Name

________________________________________
Signature

________________________________________
Date
FRSC 641 – Urban Forestry

Fall 2004 Syllabus and Class Policies

Class

MWF 10:20-10:10, 105 HFSB

Other lecture hour to be announced

Professor

Dr. W. Todd Watson

Assistant Professor of Urban and Community Forestry

Department of Forest Science, 323 HFSB

Off. 458-1753 (yes, I have 24-hour voice mail)

Hm. 693-0248 (emergencies only and not before 7:00 a.m. or after 9:00 p.m.)

t-watson@tamu.edu

Office Hours

TR 11:00-12:00 after class and by appointment (except the hour preceding class)

Course Objectives

Urban forestry is the management of tree populations in urban areas. Urban forests make our cities and communities more livable. In its broadest sense, urban forestry embraces a multi-managerial system that includes municipal watersheds, wildlife habitats, outdoor recreation opportunities, landscape design, recycling of municipal wastes, and tree and landscape plant care. More importantly, urban forestry deals with the complex interactions among various stakeholders. This course is designed to give students the opportunity to:

1. become acquainted with urban forest structure and function and the benefits and values that urban forests provide to society and the environment,
2. learn key concepts, principles, and techniques needed to create and manage urban forest resources in order to maximize benefits and minimize costs and liabilities,
3. explore the administrative challenges and opportunities involved in planning and maintaining a sustainable urban forestry program, and
4. develop professional skills, ethics, and standards of excellence that will be invaluable in your professional careers.

Texts


Selected readings at West Campus Library and on the class website

Selected Websites

Required Materials

E-mail account (active throughout the semester)

Access to the Internet

Access to a computer with word processing (e.g. MS Word) & presentation (e.g. PowerPoint) software

Enrollment on class website at [http://groups.yahoo.com/group/FRSC689/](http://groups.yahoo.com/group/FRSC689/)

Additional Reading

Additional readings will be supplied throughout the semester to supplement lectures and required readings. All additional hard-copy texts and readings will be on reserve at the West Campus Library ([http://libcat.tamu.edu](http://libcat.tamu.edu)) and/or sent to all students via the class website.

**GRADE criteria**

<table>
<thead>
<tr>
<th>Category</th>
<th>Points</th>
<th>% of grade</th>
<th>Grading</th>
</tr>
</thead>
<tbody>
<tr>
<td>Three Exams and One Final Exam (highest 3 grades)</td>
<td>300</td>
<td>30%</td>
<td>900-1000 = A</td>
</tr>
<tr>
<td>Field Trip</td>
<td>100</td>
<td>10%</td>
<td>800-899 = B</td>
</tr>
<tr>
<td>Written Report</td>
<td>150</td>
<td>15%</td>
<td>700-799 = C</td>
</tr>
<tr>
<td>Oral Presentation of Written Reports</td>
<td>100</td>
<td>10%</td>
<td>600-699 = D</td>
</tr>
<tr>
<td>Discussion Questions</td>
<td>100</td>
<td>10%</td>
<td>&lt;600 = F</td>
</tr>
<tr>
<td>Current Research Presentations</td>
<td>100</td>
<td>10%</td>
<td></td>
</tr>
<tr>
<td>Class Participation</td>
<td>150</td>
<td>15%</td>
<td></td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td>1,000</td>
<td>100%</td>
<td></td>
</tr>
</tbody>
</table>

Students will be accountable on exams for all course materials covered in lectures, guest lectures, texts, additional reading, web pages, and field trip. The final exam will be cumulative. Students will be allowed to drop their lowest exam grade. Students that have taken the first three exams and are satisfied with their grade for the course are not required to take the final exam. Students will be allowed to drop one lab quiz. In order
to be fair to all students, final grades may be curved up. Grading criteria will follow policies outlined in Texas A&M University Student Rules (see http://studentrules.tamu.edu/). There is no outside/extra work for extra credit; however, opportunities for bonus points may be available on exams or other assignments.

MAKE-UP Assignments:

Make-up assignments will follow policies outlined in Texas A&M University Student Rules (see http://student-rules.tamu.edu/). It is the student's responsibility to read and follow the Student Rules. Make-ups will be given only for acceptable, excused absences on the official University list, and I must be notified in advance of the absence (e.g. email, voice mail, written note) or by the end of the next working day after the absence in cases of emergencies. Any assignment missed without following the Student Rules will result in you receiving a grade of 0 (unless there are extraordinary extenuating circumstances, and in such cases you must appeal directly to me). If this is your first 0 on an exam, then it will automatically be your dropped grade, and you will be required to take the final (unless the final is the only exam missed). If you have already used your drop grade, then the 0 will be averaged as a grade. The make-up exam will be tentatively scheduled at the time I grant the excuse, and will be within the time frame based on your excuse. If the make-up exam is taken after the exams have been returned in class, then a different but comparable make-up exam will be given.

Class Website

Lecture notes, study questions, helpful websites, project guidelines, syllabus, and other helpful information will be posted on the Yahoo website to assist you in performing well in this class. The website contains a message board that allows you to ask questions of the class or me. In addition, there is a chat room that you are welcome to use to meet with other students and study for the exam or ask questions. The website contains a calendar that will notify you of important assignments that are outlined in the syllabus. The website will notify you of any changes that I make to the website. It is your responsibility to sign into the website (at the URL provided above) to stay current with project assignments and other useful information. If you are having trouble logging in, please let me know.

I will also post your grades on the website by the last 5 numbers of your student ID or a five digit number of your choosing. You will be given the option on the first exam to decide whether you want your grades posted and the identification number that you want to use. Grades will be posted as quickly as reasonably possible. All grades posted to the web should be considered as unofficial. In addition, your class participation grade will not be posted on the web because of the possibility of someone associating your identification number with you. The information on the website is not available for public access. My authorization is required before anyone is allowed to join the website group and view any of the information contained therein. Please meet with me personally for detailed information about your grade.

Class Project
A class project will be assigned to introduce students to some of the skills required of an urban forester. Students will be organized into teams to inventory a small portion of Texas A&M's urban forest and to develop a management plan for their area. The final report for this project will be presented both as a written document and an oral presentation. The written report will be turned in as a group project, but students will be graded individually based on the quality of their sections within the report. Oral presentations will be graded as a group project with all members in the group receiving the same grade. In the career world, written and oral skills are as valuable as an understanding of the specific discipline. In addition, "real world" projects are usually completed through team effort. Instructions will be given out later in the semester outlining specific requirements for the project. If you need help with your writing skills, the Texas A&M University Writing Center can provide assistance (see http://uwc.tamu.edu/).

CURRENT research discussions

Every week, several papers (journal articles, book chapters, etc.) will be evaluated based on a critical review of current research literature on an urban forestry topic. Each student will be required to give two short, oral presentations during the semester that are comprehensive overviews of one of the selected research projects. For the presentations, students will be allowed to select a research topic from those listed throughout the semester on the syllabus or other urban forestry topic approved by the instructor. This section will function as a seminar giving students the opportunity to practice for future scientific presentations while learning the latest scientific findings on an urban forestry topic.

This portion of the class is designed to encourage students to review all scholarly articles presented and engage in thoughtful, classroom discussions of all topics. Students will be responsible for preparing 3 thoughtful and intelligent discussion questions for the selected article(s) each week to be turned in at the beginning of class the day that the topic is discussed. The grade value of questions will be determined by dividing 100 points by the number of presentations. For example, if there are 5 students presenting (2 presentations each), then questions will be worth 3.33 points each or 10 points for each set of questions. Questions turned in late will not be accepted. In addition, students will submit PowerPoint presentations of research presentations to the instructor at the time of presentation.

Field Trip

A field trip will be required to learn practical, "hands-on" information about urban forestry from professional arborists and urban foresters. The field trip will involve an all day trip on Thursday to the Texas Tree Conference in Waco, TX on October 30, 2003. We will leave HPSC at 6:00 a.m. sharp in a university van/bus and return in the evening of the same day. All students are expected to attend the field trip. Students who cannot attend the field trip will be required to turn in a five-page review paper (single-spaced) on a selected urban forestry topic of my choosing. Field trip notes will be due the Tuesday following the field trip.
Attendance Policy

The university views class attendance as an individual student responsibility, however, attendance is expected. The class participation grade will be based on class attendance and discussion. Therefore, good attendance will help those students with borderline grades. Material will be covered in class lectures that are not in the assigned readings. Students interested in learning the course material are strongly encouraged to attend class regularly and participate in class discussions. Active learning is more effective than passive learning. Class attendance will be monitored and recorded as part of your grade. After you graduate, attendance at your job will be mandatory.

Academic Honesty and Integrity

The Aggie Code of Honor states: “Aggies do not lie, cheat, or steal, nor do they tolerate those who do.” This includes not only cheating on exams but also plagiarism, which is stealing and passing off the ideas, words, writings, etc. of another as one's own. Because I am an old Ag, I hold the Aggie Code of Honor in high regard. Those who violate this code by cheating or plagiarizing the work of others will be dealt with severely. If I have reason to suspect a student of cheating, but cannot prove it, I reserve the right to require the student to take a make-up exam. I can only help you if I know that it is your own work. Further information concerning scholastic dishonesty and plagiarism can be found in the current edition of the Texas A&M University Student Rules (see http://student-rules.tamu.edu/).

Class demeanor

It is the responsibility of Texas A&M University to provide a learning environment, and it is the responsibility of the students to respect the rights of others. Disrupting class is more than discourteous; it is a violation of Texas A&M’s policy (see http://student-rules.tamu.edu/). Out of respect for the other students, the instructor, and university regulations, electronic communication devices, such as beepers and cell phones, must be inactive during class time. Violation of this policy will result, at minimum, in the student being asked to leave the class. Similarly, other types of disruption, such as conversation, snoring, music, or rifling through the latest issue of the Battalion during the lecture will not be tolerated.

Learning assistance

I always welcome the opportunity to assist students interested in learning about urban forestry. Interaction between teachers and students is a very powerful way of learning information. Office hours are set aside for this purpose as well as other times by appointment. Because Texas A&M sets the standard for professionalism, please review the textbook and additional readings first before asking questions. This technique will serve you well in your professional careers. Out of fairness to all students, I never make my lecture notes available other than what is passed out in class or posted on the class website, so it is your responsibility to obtain notes from a classmate. I will try to use several teaching and testing methods to accommodate the varied learning styles of the
students in class. My goal is to motivate and challenge you intellectually while providing instructional support, so if you are having a difficult time grasping the material, please let me know. It is your responsibility to let me know if you need help!

DISABILITIES

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring accommodation, please contact the Office of Support Services for Students with Disabilities in room 216 of the Koldus Building. The phone number is 845-1637.

**Tentative Course Schedule**

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
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<tbody>
<tr>
<td>M 8/30</td>
<td>Course Overview</td>
</tr>
<tr>
<td>W 9/1</td>
<td>Urban Forestry Introduction</td>
</tr>
<tr>
<td>F 9/3</td>
<td>Overview and History of Urban Forestry</td>
</tr>
<tr>
<td>TBA</td>
<td>Introduction to Urban Forestry Research</td>
</tr>
<tr>
<td>M 9/6</td>
<td>Urban Sprawl and Population Growth</td>
</tr>
<tr>
<td>W 9/8</td>
<td>Urban Sprawl and Population Growth</td>
</tr>
<tr>
<td>F 9/10</td>
<td>Benefits and Costs of Urban Trees</td>
</tr>
<tr>
<td>TBA</td>
<td>Urban Forestry Research Article Presentations, <em>Research Questions Due</em></td>
</tr>
<tr>
<td>M 9/13</td>
<td>Benefits and Costs of Urban Trees</td>
</tr>
<tr>
<td>W 9/15</td>
<td>Urban Forest Values</td>
</tr>
<tr>
<td>F 9/17</td>
<td>Spatial Sciences in Urban Forestry</td>
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<tr>
<td>TBA</td>
<td>Urban Forestry Research Article Presentations, <em>Research Questions Due</em></td>
</tr>
<tr>
<td>M 9/20</td>
<td>Urban Forest Structure and Assessment</td>
</tr>
<tr>
<td>W 9/22</td>
<td>Urban Forest Structure and Assessment</td>
</tr>
<tr>
<td>F 9/24</td>
<td>EXAM #1</td>
</tr>
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<td>TBA</td>
<td>Urban Forestry Research Article Presentations, <em>Research Questions Due</em></td>
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<tr>
<td>M 9/27</td>
<td>Tree Regulations</td>
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<tr>
<td>W 9/29</td>
<td>Tree Regulations</td>
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<tr>
<td>F 10/1</td>
<td>Urban Forest Planning and Development</td>
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<td>M 10/4</td>
<td>Urban Forest Planning and Development</td>
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<tr>
<td>W 10/6</td>
<td>Trees and the Law</td>
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<tr>
<td>F 10/8</td>
<td>Urban Forestry Administration and Politics</td>
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<tr>
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<td>Urban Forestry Research Article Presentations, <em>Research Questions Due</em></td>
</tr>
<tr>
<td>M 10/11</td>
<td>Urban Forestry Administration and Politics</td>
</tr>
<tr>
<td>W 10/13</td>
<td>Tree Inventories and Management Plans</td>
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<tr>
<td>F 10/15</td>
<td>Tree Inventories and Management Plans (Campus Walk)</td>
</tr>
<tr>
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<td>Urban Forestry Research Article Presentations, <em>Research Questions Due</em></td>
</tr>
<tr>
<td>M 10/18</td>
<td>EXAM #2</td>
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<tr>
<td>W 10/20</td>
<td>Customer Service Management</td>
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<tr>
<td>F 10/22</td>
<td>FIELD TRIP</td>
</tr>
<tr>
<td>TBA</td>
<td>Urban Forestry Research Article Presentations, <em>Research Questions Due</em></td>
</tr>
<tr>
<td>M 10/25</td>
<td>Trees and the Urban Environment, <em>Field Trip Notes Due</em></td>
</tr>
</tbody>
</table>
W 10/27  Trees and the Urban Environment
F 10/29  Urban Forest Management
TBA  Urban Forestry Research Article Presentations, Research Questions Due
M 11/1  Urban Forest Management
W 11/3  Urban Forest Management
F 11/5  Urban Forest Management
TBA  Urban Forestry Research Article Presentations, Research Questions Due
M 11/8  Urban Forest Management (Campus Walk), WRITTEN REPORTS DUE 5:00 pm
W 11/10 Urban Forestry Funding Strategies
F 11/12  EXAM #3
TBA  Urban Forestry Research Article Presentations, Research Questions Due
M 11/15  Oral Presentations
W 11/17  Oral Presentations
F 11/19  Oral Presentations
TBA  Urban Forestry Research Article Presentations, Research Questions Due
M 11/22  Oral Presentations
W 11/23  Oral Presentations
F 11/25  Thanksgiving Holiday
TBA  Urban Forestry Research Article Presentations, Research Questions Due
M 11/29  Oral Presentations
W 12/1  Oral presentations
F 12/3  Urban Forestry in Jeopardy
TBA  Urban Forestry Research Article Presentations, Research Questions Due
M 12/6  Course Wrap-up
T 12/14  FINAL EXAM 8:00-10:00

* I reserve the right to make reasonable changes (with prior notice) to the topics and reading assignments outlined in the course schedule to accommodate guest lecturers and to improve the course content and learning opportunity for the students.

GOOD LUCK AND BEST WISHES FOR A SUCCESSFUL SEMESTER

Acknowledgment of the terms of FRSC 640 - Urban Forestry as stated in the preceding Fall 2003 Syllabus and Class Policies

I, the undersigned, acknowledge that I have read and understand the terms of this FRSC 689 course syllabus and class policies (as stated in the preceding 5 pages) and that I agree to abide by the terms of this document. All terms of this document are subordinate to published TAMU policies and all federal, state, and local laws and ordinances. I understand that this signed agreement must be turned in prior to the first exam to verify my acceptance of the terms.

Printed Name  Signature  Date
MEPS/FRSC 650
Plant Cell Culture in Crop Improvement
Syllabus

Course Information: (3-1) Credit 3. Focus of the course is on techniques in plant cell culture which can be applied to all crop plants, including agronomic crops, horticulture and forestry crops for germplasm improvement. Prerequisites: MEPS 313; CHEM 101; graduate classification.

Text: Plant Tissue Culture Concepts and Laboratory Exercises, 2nd Edition
R. Trigiano & D. Gray, CRC Press

Meetings: Tuesday & Thursday 9:00-10:15 Room 312 HFSB

Instructor: Jean Gould, Department of Forest Science
Office, 318 HFSB
Phone 845-5078
gould@tamu.edu

Lecture Topics – Fall 2002

I. Introduction & historical background

Introduction & background. Lecture and Laboratory Organization
The role of tissue culture in the study of plant biology & in crop improvement
Ch 3 Getting Started with tissue culture; Composition of culture media;
aseptic technique, Getting clean cultures

History - plant biology & propagation
Ch 2 History of plant tissue & cell culture
Plant Biology & Crop & tree improvement-Theoretical & Practical
Culture Media: Explants & Callus Culture, Clonal Propagation
Ch 4 Media; MS media, Discovery of the plant hormones

II. Totipotency of plant tissues - plant regeneration, propagation & cloning

Hormones & Plant Biology
Ch 8 Propagation from preexisting meristems
Propagation - Shoot Proliferation

Manipulation of Organogenesis
Ch 14 Organogenesis
Manipulation of Organogenesis
Ch 14 Organogenesis
Propagation - Somatic Embryogenesis
Ch 19 Non-zygotic embryos
Ch 40 Genetic Variation & Mutations, ‘Somaclonal Variation’ in tissue culture
III. **Crop improvement techniques that use the unique biological properties of plants**
   - Ch 43 Use of virus-free shoot meristem tissue to create virus-free plants - Potato
   - Ch 29 Use of Haploid Plants in crop improvement
   - Ch 26 Plant Protoplasts in plant biology and in crop improvement

IV. **Transformation in plant biology & crop improvement**
   - Ch 31 Transformation - dicots, cereals & gymnosperms
   - Ch 26 Protoplasts, fusion & direct gene uptake
   - Ch 32&33 *Agrobacterium* mediated transformation
   - Ch 34 Gene Gun – Biolistic particle bombardment mediated transformation
   - Analyses of gene expression (GUS); stain-based
   - *In situ* transformation: *Arabidopsis, Agrobacterium*
   - Plant Regeneration, Inheritance & ‘Somaclonal’ Genetic Mutations
   - EXAM 2

V. **Special Topics & Student Presentations**
   - Secondary Product Production *in vitro*
   - Production of ‘Nutriceuticals’
   - Genetically Modified Plants – basic biology & gene expression
   - Genetically Modified Plants- crop & tree improvement
   - Biotechnology & The Environment
   - Sustainable Agriculture & Forestry
   - Thanksgiving Holiday
   - Germplasm Conservation –Endangered Species
   - Review
   - **FINAL EXAMS**

**GRADING**

<table>
<thead>
<tr>
<th>Lecture</th>
<th>Points</th>
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<tbody>
<tr>
<td>2 Exams</td>
<td>100 points each</td>
</tr>
<tr>
<td>Final Exam</td>
<td>200</td>
</tr>
<tr>
<td>Quizzes (10)</td>
<td>100</td>
</tr>
<tr>
<td>Project (Oral/ Written/Poster)</td>
<td>100</td>
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<tr>
<td>Laboratory</td>
<td>300</td>
</tr>
<tr>
<td><strong>Total Points</strong></td>
<td><strong>900</strong></td>
</tr>
</tbody>
</table>

Grades can be improved through class participation, or through an extra credit Laboratory project. This option is available to all students.

**EXAMS**

Missed exams can be made up within the week following the original exam. If you know in advance that you will need to miss an exam, please let me know. If you have missed an exam, please contact me as soon as possible following the missed exam at 979 845-5078, or gould@tamu.edu.

The Final is not optional. To receive a passing grade in this course, you must take the Final Exam.
THE AGGIE HONOR CODE


Academic Dishonesty. Misconduct in research or scholarship includes fabrication, falsification, or plagiarism in proposing, performing, reviewing, or reporting research. It does not include honest error or honest differences in interpretations or judgments of data. In classroom situations, cheating & plagiarism are the most common forms of dishonesty.
http://www.tamu.edu/aggiehonor/definitions.php

Plagiarism. As commonly defined, plagiarism consists of claiming the ideas, words, writings, etc, of another person as your own work. You are committing plagiarism if you copy the work or the words of another person and turn it in as your own, even if you have the permission of that person. Plagiarism is one of the worst academic sins, for the plagiarist destroys the trust among colleagues without which research cannot be safely communicated.

STUDENTS WITH DISABILITIES

The American with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact the Department of Student Life for Students with Disabilities in Room 126 of the Koldus Building, or call 845-1637.

Copyrighted Material. The handouts used in this course are copyrighted. By "handouts," I mean all materials generated for this class, which include but are not limited to syllabi, quizzes, exams, lab problems, in-class materials, review sheets, and additional problem sets. Because these materials are copyrighted, you do not have the right to copy the handouts, unless I expressly grant permission.
MEPS 650
Plant Cell Culture for Crop Improvement
LAB Syllabus

Course Information: (3-1) Credit 3. Focus of the course is on the techniques of plant tissue and cell culture, from clonal propagation to genetic transformation, that are used to study plant biology and to improve plant germplasm. Many experiments will be taken from important papers published in the field of plant tissue, the plant growth regulators and plant transformation. Prerequisites: MEPS 313; CHEM 101; graduate classification.

Lab Meetings: Friday 1:00-5:00, Teaching Lab, Room 171, Norman Borlaug Institute

Instructor: Jean Gould, Department of Forest Science
318 HFSB
845-5078
gould@tamu.edu

Teaching Assistant: Marianne Arnold, Department of Forest Science
325 HFSB
845-3442

Lab Topics – Fall

Lab 1

Aseptic technique, Media preparation, Preparation of plant hormone stocks, Safety

Surface sterilization and germination of melon seeds

Lab 2

Morphogenesis: Tobacco pith- Repeat, Murashige & Skoog (1962) growth regulator assay

Lab 3

Establish sterile shoot cultures from preexisting shoots;
Examine the effect of two different culture regimens (MS/agar v MS + antioxidants + hormones/ phytagel + agar) on two woody (rose and nandina) species and two non-woody species (potato and melon)
Prepare media for next week’s class.

Lab 4

Lab 5
Somatic Embryogenesis in Melon;
Prep: Media

Lab 6
Transformation of Tobacco leaf disks using Agrobacterium tumefaciens (Horsch et al., 1982)
Prep: Media for Protoplast isolation

Lab 7
Isolation of Tobacco Protoplasts
Prep: Selection Media for germination of transgenic Tobacco seeds

Lab 8
Tobacco Protoplasts, culture and viability tests- fluorescence microscopy
Transfer and Data Collection: Tobacco, Potato, African Violet
Check: Arabidopsis plants

Lab 9
Tobacco leaf-disk transformation - GUS Assay & vapor phase seed sterilization

Lab 10
Biolistic transformation of onion epidermis
Transient Expression of nuclear targeted signal using X-GLUC & MUG

Lab 11
Standard curves Agrobacterium - Spectrophotometer
MUG Fluorimeter assays, graphing results
Reculture and data of on-going experiments

Lab 12
Arabidopsis transformation-Agrobacterium Floral dip
Prep: Media for Cryogeneic Preservation Exp.

Holiday

Lab 13
Cryogeneics Exp. Potato, pine shoots. Results of Growth Regulator Experiments
Lab book check off & Lab clean up

Literature


Kane. 2000. Micropropagation and in vitro flowering of rose. Plant tissue culture concepts and laboratory exercises. 2nd ed. 119-123.


FRSC 461/651
Geographic Information Systems for Resource Managers
Spring 2004

Instructor: Dr. R.A. Feagin
Office: 221C Centeq Building B, 1500 Research Parkway
Phone: 862-2612
E-mail: feaginr@tamu.edu

Office Hours: By appointment only. Please contact through e-mail.

Lecture: All Sections—MW 12:40a -1:30 pm. Room HFSB 102

Labs: Section 501--- T 3-5 pm, Room 214, Centeq B (Research Park)
Section 502--- M 3-5 pm, Room 214, Centeq B (Research Park)

Text: An Introduction to Geographical Information Systems
Ian Heywood, Sarah Cornelius, Steve Carver--- 1998

Course Web Page: http://www-ssl.tamu.edu/frsc461_651/

On-campus bus route to Centeq:
http://transport.tamu.edu/CMS/uploadedfiles/20032004campusparking%20map.pdf

Course Objectives:

To teach students the theory behind Geographic Information Systems.

To teach resource managers to utilize both spatial data and attribute data to
analyze natural resource problems with the aid of geographic information
technology.
To teach students the techniques of spatial data capture, storage, analysis, and presentation.

Attendance:

Make-ups on class tests, quizzes, and lab homework assignments will not be allowed unless the student has a university-excused absence.

Grading:

<table>
<thead>
<tr>
<th>Undergraduates (FRSC 461)</th>
<th>Graduates (FRSC 651)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quizzes (4) 10 pts. (2.5 pts. each)</td>
<td>Quizzes (4) 10 pts. (2.5 pts. each)</td>
</tr>
<tr>
<td>Two Tests 40 pts. (20 pts. each)</td>
<td>Two Tests 40 pts. (20 pts. each)</td>
</tr>
<tr>
<td>Lab 50 pts.</td>
<td>Lab 40 pts.</td>
</tr>
<tr>
<td>Term Paper 10 pts.</td>
<td></td>
</tr>
</tbody>
</table>

Topics  

Readings

Introduction to Course

What is GIS?/Components of GIS 3-18

Scale and Projections 19-35

Attribute Data and Database Structure 66-81
Input: Data Sources 83-101

Test #1 Wednesday, March 3, 2004

Classic Operations, GRID, TIN, and DEMs 42-65; 102-128

Managing Error 77-198

GPS and Remote Sensing 35-41

Output: Maps and Data 146-159

GIS Applications 199-252

Test #2
Wednesday, April 28, 2004

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact the Office of Support Services for Students with Disabilities in Room 126 of the Student Services Building. The phone number is 845-1637.

Lab Syllabus
Spring 2004

Materials: Lab Manual (available at Copy Corner)

Course Objectives: This course uses ArcGIS software by ESRI to apply the concepts of GIS discussed in the lecture. Three projects will be involved. The first project is an in-class project and will be completed with step-by-step leadership from the instructor. The second project is a homework project, which will be completed in six parts. The third project is a final project and each team will choose one of two problems to be solved using GIS. Lab facilities will be made available outside lab hours to allow students ample time to complete projects.
Grading: Grades for the lab will be based on attendance (7 pts.), completion of homework assignments (18 pts.), and the final project (25 pts.). NOTE: These percentages comprise a grade that is 50% of the total class grade for undergraduates and 40% for graduate students (The numbers will be adjusted for the grad. grade). Lab attendance will affect the total class grade.

<table>
<thead>
<tr>
<th>Week of</th>
<th>Topic:</th>
<th>Due:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/20-1/26</td>
<td>Introduction to Lab &amp; ArcGIS</td>
<td></td>
</tr>
<tr>
<td>2/2</td>
<td>Projections</td>
<td>Homework #1</td>
</tr>
<tr>
<td>2/9</td>
<td>Projections &amp; Internet Data Sources</td>
<td>Homework #2</td>
</tr>
<tr>
<td>2/16</td>
<td>Attribute Data &amp; Database Structure</td>
<td>Sign up for Project Topics</td>
</tr>
<tr>
<td>2/23</td>
<td>Input, Data Sources, &amp; Digitizing</td>
<td>Homework #3</td>
</tr>
<tr>
<td>3/1</td>
<td>Tentative Project plans</td>
<td>Homework #4</td>
</tr>
<tr>
<td>3/15</td>
<td>Spring Break</td>
<td></td>
</tr>
<tr>
<td>3/22</td>
<td>Tables</td>
<td>Homework # 5 and Tentative Plans</td>
</tr>
<tr>
<td>3/29</td>
<td>Interpolation and Raster Data</td>
<td>Homework # 6</td>
</tr>
<tr>
<td>4/5</td>
<td>Output &amp; Layouts</td>
<td></td>
</tr>
<tr>
<td>4/12</td>
<td>Open Lab</td>
<td></td>
</tr>
<tr>
<td>4/19</td>
<td>Open Lab/Presentations</td>
<td></td>
</tr>
<tr>
<td>4/26-5/3</td>
<td>Final Project Presentations</td>
<td>Final Presentations</td>
</tr>
</tbody>
</table>

**BE ADVISED:** Loss of data due to disk damage, failure, or misplacement will not be accepted as reason for grade alteration or deadline extension. Routine data backups are recommended for your own protection.
Forest Science 652 Syllabus
Advanced Topics in Geographic Information Systems
Spring Semester 2004
Course Instructor: Dr. R. Srinivasan (Sri
979-845-5069
r-srinivasan@tamu.edu
Centeq Bldg 221E

Office Hours: By appointment only. Please contact through e-mail.
Lecture: All Sections— W 9:10a -10:00a. Room HSFB 101
Labs: All Sections— M 9:10a – 11:50a Room 214, Centeq (Research Park)
Lab Instructor: Srin
Composition: Homework/Quizzes 12%
Mini Class projects 48%
Final Project 40%
Prerequisites: FRSC 461/651 or equivalent course or instructor’s approval
Course Objective: The objective of this course is to give students a greater understanding of advanced GIS topics. Knowledge gained in this course will give students the tools required to solve complex natural resource issues. This will be accomplished by providing experience in spatial analysis, environmental modeling, and geostatistical analysis. Students will also be exposed to internet based mapping—a technology used to disseminate spatial data.

Class Projects: Class Projects will be developed by individuals. These projects should utilize GIS and use raster data in conjunction with any type of analysis covered in this course. Project results will be delivered to the class in the form of a presentation and poster. Presentations and results should be of publishable quality. It is hoped that class project results will be formally published.

Class Abstract: An abstract of the proposed project will be submitted to the instructor on or before March 5, 2004. The abstract will be no more than 2 pages, double-spaced. It should provide a description of the project with detailed information regarding its purpose. Include learning objectives, methodology and a list of data used in the project and its availability. It should basically answer—what am I going to do, how did I get this idea, and what am I going to learn from doing it. Please include citations if applicable.

Optional Textbook: ArcGIS Extension Guides Bundle ($60.00 from esri.com)
Course Webpage: www-ssl.tamu.edu/frsc652

Topic Week 1
Course Introduction, Review of ArcView 8.3, Establishing Log-ins,
Understanding Map Projections

Week 2
The Geodatabase
GIS Analysis

Week 3
Spatial Analyst Lab I
Surface Analysis—Getting to Know Surface Types (DEMs, TINs, etc.)
Week 4
Spatial Analyst Lab II
Raster Modeling
Week 5
Spatial Analyst Lab III
Distance, Density and Statistical functions
Week 6
ArcHydro Tools—GIS for Water Resources
3-D Analyst
Week 7
3-D Analyst—Line of Sight Analysis and Viewsheds
Map Design and Cartography
Week 8
Holiday—Spring Break
Week 9
Global Positioning Systems
Basics of Geostatistical Analysis—Interpolation
Week 10
Geostatistical Analyst Lab I
Deterministic Methods, Kriging, Semivariograms, Covariance
Week 11
Geostatistical Analyst Lab II
Creating AXL Files and Setting up Map Services
Week 12
ArcIMS Lab I
Customizing with Designer
Week 13
ArcIMS Lab II
Applications
Week 14
Project Work Day
Guest Lecture
Week 15
Project Presentations

Note:
The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact the Office of Support Services for Students with Disabilities in Room 126 of the Student Services Building. The phone number is 845-1637.
FRSC 653: Computer Programming for Natural Resources Applications
SYLLABUS and TENTATIVE SCHEDULE

Instructors: Dr. Marian Eriksson  Dr. R. Srinivasan
Department of Forest Science  Director, Spatial Sciences Lab
Office: 320 HFSB or 221C Centeq  Office: 221A Centeq
eMail: m-eriksson@tamu.edu  eMail: r-
srinivasan@tamu.edu  Office Hours: TBA
Office Hours: TBA

Lecture/Lab: Centeq;  B214 HFSB
Section  Meeting Time
600  TBA

Prerequisites: Approval of the instructors.

Justification and Objective

This course is intended for graduate students with little or no previous experience with formal programming languages. Students entering graduate-level remote sensing and GIS programs come from a wide array of undergraduate programs, many of which require only the completion of a computer literacy course for graduation. To make maximum use of any type of analytical software often requires that the user “think outside of the box” – that they coax programs into doing things that the designers of the program had not thought of or had chosen not to include. Also, even when the desired functionality is included with the software, it is often necessary to perform the same task on many different objects. The ability to automate such repetitive and tedious tasks often results in substantial increases in efficiency (and coincident decrease in tedium and boredom).

A macro is a program, often a very small program, that is written to run from within a larger program package. At this time Visual Basic for Applications (VBA) is the macro programming language of choice in a large number of program packages. This includes most Microsoft products, ArcGIS, and ERDAS. In time, this may change and other languages may come to dominate. That won’t matter—once you have learned one programming language it is easy to pick up another because the concepts are the same in all languages.

The course is organized in two distinct portions. In the first portion, lasting 9 weeks, you will learn the fundamentals of VB programming. This portion will be taught by Dr. Eriksson. In the second portion, lasting 5 weeks, you will apply and extend the VB programming skills learned in the first to writing macros for ArcGIS. The second portion of the course will be taught by Dr. Srinivasan.
First Portion

Since Excel is unquestionably the most widely used analytical tool, since most undergrads are introduced Excel, and since it lends itself well to the development of an understanding of Visual Basic programming concepts and techniques, most of the first portion of the course will use Visual Basic for Excel Applications. You will leave this portion of the course with an understanding of the VBA environment, top-down programming, data types, arrays, subroutines and functions, conditional branching, looping, branching to other subroutines and functions, a general understanding of forms and the use of objects. You will also be introduced to objects, the use of flow charts and debugging tools.

Second Portion

Visual Basic macro programming in ESRI ArcGIS: ArcGIS is a powerful and an 'expandable' software, meaning that its capacity/purpose can be extended and/or customized based on user's interests. Just as you have seen in the MS-Excel, the macro environment is available in the ArcGIS to help users extend and/or customize some of the applications in the ArcGIS. VBA offers the same tools as Visual Basic (VB) but provides them in an existing application—in this case the core ArcGIS applications, ArcMap and ArcCatalog, and the ArcGIS extension, ArcScene. VBA is built into each of these applications. In this second portion of the course, you will be acquainted with how VBA programming language is used to perform user-specific operations within the ArcGIS. Also, you will complete other user-specific customization of the ArcGIS Control tools and write VBA codes to extend its applications. At the end of the course, you will be well informed about programming in the macro environment in general and the applications of VBA both in the MS-Excel and the ESRI's ArcGIS in particular.

Homework: Weekly homework assignments will be made. These will be a combination of short tasks intended to learn programming concepts and somewhat longer tasks intended to develop programming competency. Each assignment will count equally toward the final grade unless noted otherwise. It is important that you keep up with the material. Therefore a 2% late deduction will be assessed for each workday that an assignment is late.

Exams: There will be two exams, each covering the material from the preceding third of the course. The exams will be comprehensive only to the extent that material in the second builds on material from the first and material in Dr. Srinivasan's third of the course will build on material covered in Dr. Eriksson portion.


*Tentative. We are still evaluating books. Of those books evaluated to date, even though this book is for .Net, it has the best discussion of programming basics.
Supplemental reading materials will be posted on the course websites.

Material

Web sites  tapc.tamu.edu (1st portion) and www-ssl.tamu.edu/university courses (2nd portion)

Grading:  
1st Portion:  
Breakdown:  
Homework 1-8 (4% each)  32%  
Homework 9 "Project"  8%  
First on-line exam  10%  
2nd on-line exam  16%  

2nd Portion:  
Breakdown:  
Two mini projects (7% each)  14%  
Main project  20%  

TENTATIVE LECTURE SCHEDULE

<table>
<thead>
<tr>
<th>Lecture</th>
<th>Topic(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1a</td>
<td>Housekeeping; Hello World / elements; Review Excel</td>
</tr>
<tr>
<td>1b</td>
<td>Review Excel: data types; classes of functions esp. string, logical, lookup; record macro; review Access – basics</td>
</tr>
<tr>
<td>2a/b</td>
<td>Basics: Top-down; memory &amp; variables; naming conventions &amp; rules; reserved words; operators; assignment statements; data types; strong vs weak typing / Option Explicit; functions (MsgBox); VBE esp. Immediate Window; Step-Into/Run/Break points; objects (general) / Debug.Print, Application/Range/Cells (Cells will be the primary form of I/O for the next 4½ -5 weeks).</td>
</tr>
<tr>
<td>3a/b</td>
<td>Strings &amp; string functions; order of precedence; record macro – Cell properties; using With; vb/mso/xl constants (Object Browser); If and Select blocks; conditions &amp; logical functions; flow charting basics;</td>
</tr>
<tr>
<td>4a/b</td>
<td>Events; Error-trapping &amp; debugging; For / Do while / Do until; initializing; accumulators; flow-charting; nested Ifs; nested loops; Exit. May take 2 lectures, if so then at the expense of scripting or stand-alone topics. Assign to read about DMD before next lecture.</td>
</tr>
<tr>
<td>5a</td>
<td>Larger example (DMD for polygon area). On-line exam assigned, due within 48 hours.</td>
</tr>
<tr>
<td>5b</td>
<td>User-defined functions; calling other subs; modify DMD; named &amp; optional arguments; recursive functions; scope/lifetime of variables; idea of garbage collection. Modify DMD to (1) call function, subs and (2) use optional parameter to start with (x,y).</td>
</tr>
<tr>
<td>6a</td>
<td>Arrays &amp; the Array function; Option Base; ReDim (since they will have been working with Cells, this should be straight-forward). Modify DMD to use arrays; Other kinds of statements</td>
</tr>
<tr>
<td>6b</td>
<td>Using objects; forms &amp; controls; finding objects; the Object Browser; Active-X &amp;</td>
</tr>
</tbody>
</table>
Addins – info only, very general; Word, Access, Arc basic objects

7a Working with objects: charts, drawing, etc.
7b General I/O; working with files; Database functions / link to Access;
8a Review HTML & intro client-side scripting
8b Intro server-side scripting; database connections; Excel as client; Excel as server
9a Intro stand-alone programming. Take home practical assigned.
9b Creating a stand-alone program: simple but complete (through the creation of a setup.exe file). Assign on-line exam to be taken after HW 9 is complete.

xx HW9 & on-line exam due in week 10.
10a Review ArcGIS: applications and components (arcMap, arcCatalog, arcInfo)
10b Review VBA in ArcGIS: familiarization with data types and classes of functions (application, document, map, layer and feature layer); types of built-in controls
11a Intro to customizing ArcGIS: addition of custom controls such as Commands, Tools, EditBox, ComboBox and Menu to the ArcMap interface; customize ArcCatalog
11b Create new UIToolControl: customize with new Control Tools (create new toolbars and menus); define variables; add VBA codes to command the functionality of the Control Tools.
12a/b Using ArcObjects with VBA; reading ArcObjects OMD’s class: define interfaces, properties and methods for an object; reading ArcObjects OMD’s interfaces: methods of communication with an object, defining logical groups of methods and properties; reading ArcObjects OMD’s properties and methods: set/read properties and perform actions
13a ArcObjects OMD’s class relationships: inheritance, instantiation, composition and association; Navigating OMD: MxDocument class, Map class and Query Layer class
13b Testing an object reference (type of variable, typeOf object, nothing); programming tips
14a/b Intro to stand-alone VB programming; creating a stand-alone simple VB programs to run using ArcGIS resources. Working with ArcCatalog: registering dll and Add-Ins

**TENTATIVE EXAM SCHEDULE:**

First on-line exam: Week 5
Second on-line exam: Week 9

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As commonly defined, plagiarism consists of passing off as one's own the ideas, words, writings, etc., which belong to another. In accordance with this definition, you are committing plagiarism if you copy work of another person and turn it in as your own; even if you should have the permission of that person. Plagiarism is one of the worst academic sins, for plagiarism destroys the trust among colleagues without which research cannot be safely communicated.
If you have any questions regarding plagiarism, please consult the latest issue of the Texas A&M University Student Rules, under the section "Scholastic Dishonesty."

Work hard! Have a good semester!
Appendix III-2
Graduate Handbook
A Policy Handbook
prepared by
The Graduate Programs Committee

September 2003

DEPARTMENT OF FOREST SCIENCE
TEXAS A&M UNIVERSITY
COLLEGE STATION, TEXAS 77843-2135

PHONE: (979) 845-5033
FAX: (979) 845-6049
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I. INTRODUCTION
Graduate work leading to the Master of Science and Doctor of Philosophy Degree in Forestry is administered by the Faculty of the Forest Science Department, in conformance with the rules of the Office of Graduate Studies at Texas A&M University. Members of the Faculty can also direct students in the Master of Agriculture in Natural Resource Development degree.

This document states the requirements for graduate study in forestry as determined by the Faculty of Forest Science and supplements University requirements as set forth in the TAMU Graduate Catalog, and the TAMU Graduate Student Handbook and both should be consulted when questions concerning policy arise. In cases where this document is in conflict with the Graduate Catalogs or the TAMU Graduate Student Handbook, those documents should be considered correct.

II. ADMISSIONS PROCEDURES
In order to be considered for admission to the graduate program in forestry, an applicant must submit the following:

1) Application for Admission to Graduate Studies, obtained through and submitted to the Office of Admissions and Records (Texas A&M University, College Station, Texas 77843-0100 Telephone: 979-845-1031) or http://tamu.edu/admissions/.


3) Graduate Record Exam (GRE) scores (Verbal and Quantitative), submitted directly to the Office of Admissions and Records by the Educational Testing Service (ETS) which conducts the exam.

4) Test of English As A Foreign Language (TOEFL) scores, for those students for whom English is a second language, submitted to the Office of Admissions and Records.

5) Three letters of recommendation or reference report forms, submitted to the Department of Forest Science (Texas A&M University, TAMU 2135, College Station, Texas 77843-2135, Fax (979) 845-6049)

An application fee is also required. Only complete dossiers will be reviewed for admission. Normally items 1, 2 and 4 are sent together, though they may be forwarded separately, if necessary. Item 3, the GRE score, must be sent directly by ETS. Recommendation letters, item 5, should be sent directly by the references. Students are encouraged to apply before October 1 for the spring semester and before February 1 for summer sessions or fall semesters. A member of the Forest Science graduate faculty must be willing to advise the student for the student to be admitted.

III. UNDERGRADUATE PREPARATION
A prospective candidate for a graduate degree in forestry must hold a baccalaureate degree from an accredited institution. Additional undergraduate coursework may be sometimes required for students without sufficient background as determined by the student's advisory committee.

IV. GRADUATE PREPARATION – CORE COURSEWORK
The faculty of Forest Science has determined that a graduate student's education must include a general view of current issues in forest science, statistics and the research process.

The Master of Science and Doctor of Philosophy degrees are awarded principally for the demonstration of the ability to conduct significant, original research. Individualized degree plans are prepared by the student in consultation with the Advisory Committee (for composition of the Advisory Committee, see Degree Requirements), with consideration to the student's background, interests and career objectives.

The core curriculum includes the following courses:
Core Courses in FOREST SCIENCE for Graduate Students

FRSC 606 – Research Process
FRSC 620 – Advances and Issues in Forest Science
Statistics (course recommended by Advisory committee)

The faculty of Forest Science recognizes that a certain body of knowledge and skills is necessary to work professionally in forestry. This body of knowledge is therefore prescribed as a core curriculum to ensure that all students meet common standards and that they have the breadth of education to understand the range of topics covered in forest science. Core curriculum requirements may be met by courses on previous degree plans, including the baccalaureate degree, or by courses at other universities. No more than nine units of degree plan coursework may be in undergraduate courses.

In addition, all students must assist in teaching a course or take a course approved by the Department relating to development and communication of academic training and classroom materials.

V. DEGREE REQUIREMENTS

A. The Master of Science Degree (Thesis Option)
The M.S. degree (thesis option) in Forestry requires coursework, a thesis and a final examination.

1. Time and Credit Hours Required: The major requirements for the degree are the completion of 32 credit hours and the submission of an acceptable thesis. The 32 hours are usually divided among 23 hours coursework (to include at least 15 hours of graduate courses in forestry or related areas) and 8 hours research. The degree plan is developed by the student’s Advisory Committee in consultation with the student.

2. The Advisory Committee: The Advisory Committee consists of a major advisor serving as chair, and two or more other members of the Graduate Faculty, one of whom must be from a department other than Forest Science. Members of the Advisory Committee are chosen with consideration given to the specialized subject areas in forestry and supporting fields.

3. The Degree Plan: The degree plan must be approved by the student’s Advisory Committee, the Department Head and the Office of Graduate Studies, within 1 year of enrollment. A registration block will be applied to students who do not have an approved degree plan within 2 semesters.

4. The M.S. Thesis: The student should begin informal planning for a suitable project for thesis research during the first semester of graduate study. A formal proposal describing the research should be submitted to the Office of Graduate Studies for approval at least 14 weeks prior to the close of the semester in which the student expects to graduate. The student’s Advisory Committee should be kept informed of research progress, usually through formal presentations, progress reports and submitted publications.

5. The Final Examination: A final comprehensive oral examination conducted by the Advisory Committee is required and will include questions on the thesis and on forestry and the other coursework taken in the program.

6. Publication of Research Results: It is expected that the student’s thesis will generate new information of interest to other researchers and workers. Students should discuss publication procedures with the major advisor early in the graduate program. Publication expectations depend to some extent on the nature of the graduate student funding.

B. The Master of Science Degree (Non-Thesis Option)
The requirements for the degree are essentially the same as for thesis option. Instead of the thesis, students are required to do extra coursework and a professional paper. Student must complete a minimum of 36 credit hours, of which 18 credit hours must be in the Department of Forest Science, and a minimum of six credit hours in supporting fields. No hours of FRSC 691 (Research) may be counted toward the non-thesis
option Master of Science degree. Students pursuing the non-thesis option will enroll in three hours FRSC 685 (Problems) to write the professional paper.

C. The Master of Agriculture, Natural Resources Development Degree
The Master of Agriculture in Natural Resource Development is a college level degree. Faculty within the Department of Forest Science can supervise students pursuing this degree. Students are referred to the TAMU Graduate Catalog for degree requirements.

D. The Doctor of Philosophy Degree
1. Time and Credit Hours Required: The time necessary to obtain the Ph.D. degree is markedly influenced by the student’s preparation, particular research interest and competence in the field selected. At least four years of study beyond the bachelor’s degree are commonly required. A minimum of 96 hours beyond the baccalaureate degree or 64 credit hours beyond the master’s degree is required for the Ph.D. degree. Sometimes the nature of the research or inadequacies of undergraduate preparation may make a longer period necessary.

2. The Advisory Committee: The student’s Advisory Committee consists of the student’s major advisor who serves as chair and three or more members of the Graduate Faculty representing the student’s several fields of study. One member of the Committee must be from a department other than Forest Science. The members of the Committee should be chosen with consideration given to the specialized subject areas in forestry and supporting fields in which the student intends to do research.

3. Degree Plan: In the first or second semester, the student will initiate a meeting with the Advisory Committee to discuss goals, background and a specific program of courses, research and teaching. At that time, the Advisory Committee will make an evaluation of the student’s progress and preparedness and suitability for the selected course of study. Successful evaluation will allow the student to continue under guidance of the Advisory Committee, who will assist the student in the preparation of a degree plan and monitor the student’s progress with scheduled meetings during the student’s period of study.

The student’s proposed degree plan must be submitted to the Office of Graduate Studies within 1 year of enrollment. The proposed degree plan must be approved by the student’s Advisory Committee, the major advisor, the Department Head and the Office of Graduate Studies.

4. The Research Program: The student should begin planning of the suitable project for dissertation research during the first year of graduate study. An approved formal proposal describing the planned research must be submitted to the Office of Graduate Studies.

5. Examinations: The Department of Forest Science and the student’s Advisory Committee may require qualifying, cumulative or other types of examinations at any time. These examinations are in addition to the preliminary and final examinations and are given at the discretion of the Department of Forest Science and the student’s Advisory Committee.

The preliminary examination is required for Ph.D. students in Forestry, and is administered by the Advisory Committee. The earliest this exam can be given is when a student is within the six credit hours of finishing coursework, but it must be given no later than the end of the first semester after completion of coursework. The preliminary examination must have both oral and written components, unless otherwise recommended by the Advisory Committee and approved by the Office of Graduate
Studies. This examination is concerned with competence in forestry as well as other areas designated by the Advisory Committee.

Before taking the preliminary examination, the student should devote considerable time to the study. The student will be expected to know the principles of forestry and the factual material usually taught in the courses in his or her specialized discipline areas, and should also demonstrate a broader understanding of basic principles and a greater ability to synthesize than is ordinarily required in individual courses. When the student has successfully completed the preliminary written and oral examinations, then he or she is officially admitted to candidacy for the Ph.D. degree.

6. The Ph.D. Dissertation: The major requirement for the Ph.D. degree is the completion of a dissertation that meets the approval of the Advisory Committee and the standards of Texas A&M University. Such approval implies that the candidate's research makes a significant original contribution to the body of knowledge and understanding in the particular field of forestry, had been carried out and reported in a manner demonstrating the ability of the candidate to independently plan and execute original inquiry. A draft copy of the dissertation must be distributed to each member of the Advisory Committee at least two weeks prior to the final examination.

7. Final Examination: A final comprehensive oral examination conducted by the Advisory Committee is required and must include questions on the dissertation and on forestry and other coursework taken in the program.

8. Publication of Research Results: It is expected that the student's dissertation will generate new information that should be disseminated to other researchers and workers. Students should discuss publication procedures with the major advisor early in the graduate program. Publication expectations depend to some extent on the nature of the graduate student funding (see, for example, Publication of Research Findings under Graduate Assistants Research - The Texas Agricultural Experiment Station).

E. Skipping the M.S. Degree
Under certain circumstances, a student may petition to skip the M.S. degree. This request must be in the form of a formal petition and requires approval of the student's Advisory Committee, the Department Head and the Office of Graduate Studies.

Although not expected to be a common occurrence, an entering student, having completed only the baccalaureate degree, may be permitted to immediately enter the Ph.D. program. Criteria that may be considered in the petition approval process are (1) very strong, broad academic experience; (2) demonstrated commitment to academic excellence; (3) previous experience with the research process; and/or (4) involvement in an exceptional undergraduate thesis.

A more usual circumstance is a graduate student who, after enrollment and some tenure in the M.S. program, petitions to change the degree plan to the Ph.D. degree. Criteria that may be considered in such a change are (1) above-average performance in a substantial portion of the post-baccalaureate coursework required for the M.S. degree; (2) publication of scholarly work in peer reviewed journals; (3) presentation of completed research at regional or national meetings; (4) quality of performance in any written and/or oral examinations administered by the student's Advisory Committee; and, (5) any other criteria that the Department Head and/or the Office of Graduate Studies may use in their petition approval process.

Assistantship stipends will remain at the M.S. level until the student is formally accepted into the Ph.D. program (enrolled as G8 student).
VI. FORMAL SEMINAR: PRESENTATION OF THESIS, DISSERTATION OR PROFESSIONAL PAPER FINDINGS

After completion of the thesis, dissertation or professional paper, the student is required to present the findings to the faculty and students of the Department of Forest Science and members of the University community. This formal presentation may be given immediately prior to the student's final defense examination or scheduled at a different time.

VII. FINANCIAL AID: GRADUATE ASSISTANTSHIPS, FELLOWSHIPS, OTHER

Teaching and research assistantships are available on a competitive basis to qualified students. Stipend amounts vary. Out-of-state students who receive assistantships from 50% time pay only resident tuition and fees. Students holding graduate assistantships are eligible to participate in the TAMU System health insurance program.

Financial assistance maybe provided by the College of Agriculture and Life Science, the Texas Agricultural Experiment Station, Texas A&M University, government sources, private foundations and industry. The College assistantships are designated as either Graduate Assistant Teaching (GAT) or Graduate Assistant Non-Teaching (GANT). Assistantships from all other sources are designated as Graduate Assistant Research (GAR). The requirements for GAT and GANT are essentially the same as those for the GAR. These requirements are listed below in Sections VIII and IX.

A limited number of Graduate Fellowships are available through the University for first-time enrolled graduate students with outstanding academic records. These may carry higher stipends, and require no service. The Department of Forest Science also has a limited number of fellowships.

Information on financial aid in the form of loans and grants is available through the Student Financial Aid Office (College Station, Texas 77843-1252, Telephone: 979-845-3236, Website: http://faid.tamu.edu/).

Employment leads for on and off campus jobs are available in the Student Financial Aid Office lobby.

VIII. GRADUATE ASSISTANTS-RESEARCH

A. General

The Texas Agricultural Experiment Station (TAES), Texas A&M University, the Texas Forest Service and other allied Texas A&M University System agencies conduct scientific and technological research for the benefit of the citizens of Texas. Graduate Assistants-Research are employed to assist with research programs. These assistantships are awarded on a competitive basis by faculty members and are administered by the department.

GAR's are expected to conduct their thesis or dissertation research as a part of an ongoing research project under the direction of a departmental scientist. GAR salaries and other resources are expended for mission-relevant activities.

B. Publication of Research Findings

Students and other investigators have an obligation to report the results of research efforts. Students should discuss publication procedures with their major advisors early in their graduate programs, and plan ahead for the timely publication of results. The obligation and authority to disseminate the results of thesis or dissertation research rests with the major advisor and/or the principal investigator of funded research.

C. Employment Status

GAR's are employees and are subject to the rules governing other employees. GAR's are eligible to participate in the TAMU System health insurance programs. Research Assistants do not earn or receive annual leave, sick leave or paid holidays and are expected to observe the regular working schedule of the University System.

Each assistant will be assigned to a supervisor (usually his or her Advisory Committee Chair) who is responsible for the satisfactory completion of tasks assigned to fulfill the requirements of the assistantship.

Appointments of research assistantships are normally on a half-time basis and require a minimum work commitment of 20 hours per week. Actual work performed on behalf of a thesis or dissertation may be used
in partial fulfillment of this obligation but first-year students would normally be assigned other tasks. By doing required work, under supervision, the student learns the research process.

D. Performance Expectations
The performance of GAR’s is evaluated each year prior to renewing the assistantship (see page 7). Each student is expected to:

1) Complete assigned tasks in an efficient and professional manner.
2) Assume responsibility for organization and completion of assigned tasks.
3) Balance workload and academic load. Graduate assistants must register for nine hours each spring and fall semester and for three hours each 5-week summer session (alternately, six hours for the 10-week session). In some circumstances, more hours may be taken if approved by the Advisor and the Department Head.
4) Maintain a minimum 3.0 grade point ratio.
5) Submit an approved program of study to the Office of Graduate Studies in a timely manner.
6) Submit an acceptable thesis or dissertation research proposal prior to beginning the actual research required to achieve the degree.
7) Make satisfactory progress toward completion of approved coursework and research program.

Work performance will be evaluated each year by the supervisor. Academic progress will be monitored by the major advisor. The results of the evaluation will be shared with the student and becomes part of the student file. Failure to adequately meet expectations may result in non-renewal of the assistantship. If the student’s cumulative grade point ratio falls below 3.0, the student will be placed on academic probation. While on this status, the student cannot receive an assistantship stipend until the cumulative grade point ratio of 3.0 is attained.

IX. GRADUATE ASSISTANTS-TEACHING AND -NONTEACHING - THE COLLEGE OF AGRICULTURE AND LIFE SCIENCES
Graduate Assistants-Teaching (GAT) and -NonTeaching (GANT) provided by the College of Agriculture and Life Sciences are administered at the departmental level and are awarded on a competitive basis. Performance expectations, work commitment, stipend interval, etc. for these assistantships are usually the same as those for the GAR.

X. GRADUATE STUDENT PARTICIPATION IN TEACHING PROGRAM
It is the general philosophy of the Forest Science faculty that involvement in teaching activities is an important and necessary part of the graduate education process. The intent is to broaden student’s experiences and horizons, provide opportunities to present information before audiences and aid in the preparation and training of the degree candidate for a successful professional career.

Graduate students in the Department of Forest Science will participate in the teaching program for at least one semester, or take an approved course relating to curriculum development and instructional communication. This participation will be expected of all degree candidates. The graduate student participating in the teaching program can expect to give laboratory instruction, lectures, and computer instruction, prepare audiovisual aids, develop new laboratory exercises, and assist with grading. The remaining hours, out of the 20 hours for which the graduate student on an assistantship is paid, will be utilized for research purposes under the direction of the student’s major advisor. The major advisor and the teaching supervisor are expected to cooperate in assuring that the student’s schedule is fair and equitable.

Graduate students will be assigned to support specific classes. Every effort will be made to assign students to classes taught by their major advisor or in their particular area of expertise. The role of the teaching assistant shall be determined by the professor in consultation with the teaching assistant.

XI. GRADUATE PROGRAMS COMMITTEE (GPC), AND ASSOCIATE HEAD FOR GRADUATE PROGRAMS, DEPARTMENT OF FOREST SCIENCE
The Graduate Programs Committee (GPC) is composed of several members of the TAMU graduate are appointed by the Department Head. The GPC serves at the discretion of both the Department Head and the faculty. It is an advisory group organized to provide a consistent policy regarding graduate education in the Department of Forest Science. The GPC also serves as the admissions committee and recommends graduate student awards. The GPC will participate in resolving problems or grievances at the discretion of the Department Head.

The chair of the Graduate Programs Committee is the Associate Head for Graduate Programs. The Department Head will normally delegate to the Associate Head decision making and signatory authority on routine matters involving graduate programs in the Department of Forest Science.

XII. GRADUATE STUDENT ORGANIZATION (GSO), DEPARTMENT OF FOREST SCIENCE
The graduate students of the Department of Forest Science meet formally on a regular basis and elect a representative who is a liaison between the faculty of Forest Science and the GSO. The GSO representative is responsible for representing the academic and non-academic interests of the GSO to the department, college, and university. The structure and activity level of the GSO is the responsibility of the graduate student membership.

XIII. FORMS
All necessary Office of Graduate Studies (OGS) forms for graduate programs can be found on the Internet. The address is: http://vpr.tamu.edu/ogsforms.html. Forms are also available in HFSB 311.
Appendix III-3
Certificate Requirements
Appendix III-3  Course Requirements for Graduate Certificates

Graduate Certificate in Geographic Information Systems (GIS)

Introductory Level (1 of the following is required)  3 hours

- FRSC 651/BAEN 651 – Geographic Information Systems
- GEOG 660 – Applications for GIS

Intermediate Level (Both are required)  6 hours

- FRSC 652/BAEN 652 – Advanced Topics in GIS
- GEOG 665 – GIS – based Spatial Analysis and Modeling

Specialized GIS Courses (1 of the following is required)  3 hours

- ENTO 625 – Landscape Biology
- PLAN 625 – Introductory GIS in Landscape Architecture and Urban Planning
- RLEM 635 – Landscape Analysis
- BAEN 610 – Spatial Technology for Site – Specific Crop Management

Graduate Certificate in Remote Sensing

Introductory Level (1 of the following is required)  3 hours

- GEOG 651 – Remote Sensing for Geographical Analysis

Intermediate Level (both are required)  6 hours

- GEOG 661 – Digital Image Processing
- FRSC 661 – Photo Interpretation

Specialized Remote Sensing Courses (1 of the following is required)  3 hours

- BUSH 689-653 - Technical Collection Systems in International Security
- GEOG 696 – Geomorphology and Remote Sensing
- METR 655 – Satellite Data in Meteorology
- ELEN 634 – Morphological Methods in Image and Signal Processing
• ELEN 642 – Digital Image Processing
• ELEN 649 – Pattern Recognition
• BAEN 610 – Spatial Technology for Site – Specific Crop Management

Graduate Certificate in Tree Improvement

The following four courses and a practicum are required:

• FRSC 430/630  Introduction to Tree Improvement  3 hours
• FRSC 632  Forest Genetics  3 hours
• FRSC 634  Plant Functional Ecology  2 hours
• FRSC 635  Forest Biotechnology  2 hours
• FRSC 636  Forest Genetics Practicum  3 hours
Appendix IV-1
Faculty
Curriculum Vitae
Name: Dr. David N. Appel

Academic Rank: Professor and Associate Department Head
Department of Plant Pathology & Microbiology
Texas A&M University, College Station, TX  77843-2132

Date of Birth: May 18, 1951 (Parkersburg, WV); 236-82-8530

Education: B.S., West Virginia University, Biology, 1973
M.S., West Virginia University, Plant Pathology, 1976
Ph.D., Virginia Tech, Plant Pathology, 1981

Professional and Academic Appointments:
Professor, Plant Pathology & Microbiology (PLPA), Texas A&M University, 1993 – present
Associate Department Head, Academic Programs (PLPA), 1991 – present
Interim Department Head, (PLPA), Texas A&M University, 1999 – 2001
Associate Professor, (PLPA), Texas A&M University, 1988 – 1992
Acting Department Head, (PLPA), Texas A&M University, 1989 – 1990
Assistant Professor, Dept. of Plant Sciences and PLPA, Texas A&M University, 1981 – 1987

Professional Awards and Recognition
1976 Graduate Student Research Award, Potomac division, American Phytopathological Society
1982 Outstanding Professor, Plant Sciences Club, Dept. of Plant Sciences, TAMU Dept. of Plant Sciences
1991 Outstanding Plant Pathology Faculty Award, Department of Plant Pathology and Microbiology, TAMU
1995 Selected to participate in ESCOP (Experiment Station Committee on Organization and Policy) Leadership Development Program (Class 5), NASULGC

Research Activities:
My research objectives focus on the applications of current technologies to solve problems in trees and other woody plants. Interests have included the use of remote sensing and geographic information systems (GIS) for plant disease detection, loss assessment, and quantification of pathogen spread. Recent efforts have focused on the use of molecular markers to study the population biology of pathogens and their hosts. The high incidence and severity of oak wilt in Texas, in addition to intense public concern, has necessitated devoting a great deal of time on aspect of the epidemiology of that disease. These include insect vector relationships, inoculum availability, and spread through root systems. Experimental controls of oak wilt have included mechanical
disruption of roots, intravascular injection of fungicides, and the potential for biological control with endophytic bacteria.

**Publications:**


**Total Number of Publications:**
- Refereed journal articles – 22
- Extension, popular publications – 6
- Abstracts – 23
- Symposium Proceedings – 10
- Book Chapters – 1

**Societies:**
- American Phytopathological Society
- National Association of Environmental Professionals
- International Society of Arboriculture

**Graduate Students Advised:**
- M. Agric. – 1
- M.S. – 9
- Ph.D. – 2

**Current Courses Taught:**
- PLPA 301 Introduction to Plant Pathology
FRSC 307 Forest Protection
PLPA 626 Diagnosis of Plant Diseases
PLPA 489 Environmental Toxicology and Regulations
PLPA 681 Seminar

Externally Funded Research (Current):

“Studies on Pierce's Disease of Grapes”. USDA APHIS.

“Survey for Invasion of Asian Dodder in Texas”. USDA APHIS.


“Demonstration of Comprehensive Oak Wilt Management”. Alice Walton Foundation.
DIANA MARIE BURTON  
Associate Professor  
Department of Forest Science, Texas A&M University, College Station, TX 77843-2135  
(979) 845-2577 FAX: (979) 845-6049 e-mail: d-burton@tamu.edu

EDUCATION
University of California, Berkeley, Department of Agricultural and Resource Economics. PhD 1991  
University of California, Berkeley, Department of Agricultural and Resource Economics. MS 1986  
Massachusetts Institute of Technology, Sloan School of Management. MS 1979  
Massachusetts Institute of Technology, Sloan School of Management. BS 1979

PROFESSIONAL ACADEMIC EXPERIENCE
Department of Forest Science, Texas A&M University, College Station, TX  
Associate Head for Research and Graduate Studies, 1999 - 2002;  
Associate Professor with tenure, 1997 - present; Assistant Professor, 1992 - 1997;  
Joint appointment in the Department of Agricultural Economics, Texas A&M University.

PROFESSIONAL CORPORATE AND GOVERNMENT EXPERIENCE
Wells Fargo Bank, San Francisco, CA. 1983-1985. Performed analytic, design and implementation work for employee benefit plans, coordinated the implementation of a 401(k) savings plan and termination of a defined benefit pension plan.  

SELECTED RECENT HONORS, RECOGNITION AND LEADERSHIP
College of Agriculture and Life Sciences (COALS) Congressional Internship Program Selection Committee  
Task Force to Propose a School of Renewable Natural Resources  
COALS Graduate Council  
Vice Chancellor Awards in Excellence Committee  
APFAC-Agricultural Programs Faculty Advisory Committee to Vice Chancellor and Dean  
Forest Science Graduate Program Committee Chair  
Undergraduate Programs Committee  
Various Search Committees  
Promotion and Tenure Committee  
Forest Resource Option Advisor  
Associate Editor, Forest Science, 1998 – 2004  
USDA NRI Grant Panel  
Reviewer for forestry, resource, agricultural economics and economics journals; USDA and
other grant programs.

COURSES TAUGHT
FRSC 314 Forest Economics and Valuation: Valuation, production and forest products markets.
FRSC 406 Forest Policy: Historical development and current issues in forest and resource policy.
FRSC 620 Advances and Issues in Forest Science: Team-taught with ecologist Mark Tjoelker. Graduate course on recent scientific and policy developments in forestry and related fields.
FRSC 685 Special Problems in Forest Economics and Policy: Advanced graduate work.

SELECTED RESEARCH GRANTS AND CONTRACTS


SELECTED RECENT PUBLICATIONS AND PAPERS


THOMAS D. BYRAM
Western Gulf Forest Tree Improvement Program Geneticist and Assistant Professor
Texas Forest Service and Department of Forest Science, Texas A&M University

Forest Science Laboratory
College Station, TX 77843-2585
Telephone: (979) 845-2556  FAX: (979) 845-3272
e-mail: t-byram@tamu.edu

Education

1975  B.A  (Biology)  Hendrix College, Conway, AR
1978  M.S.  (Forestry)  Texas A&M University, College Station, TX
2000  Ph.D.  (MEPS)  Texas A&M University, College Station, TX

Experience

1976-1978  Research Assistant, Department of Forest Science, Texas A&M
University, College Station, TX.


2001-Present  Associate Geneticist, Texas Forest Service. Responsible for the
direction of the Texas Forest Service Pine and Hardwood Tree
Improvement Programs, Western Gulf Forest Tree Improvement
Program – Pine, Western Gulf Forest Tree Improvement Program
– Hardwood, and Urban Tree Improvement Program.

2001-Present  Assistant Professor, Department of Forest Science. Research
problems addresses operational tree improvement problems for
both pine and hardwood species.

Professional Memberships

Society of American Foresters
SAF Genetics and Tree Improvement Working Group
Seed Orchard Pest Management Subcommittee of the Southern Forest Tree Improvement
Committee (Current Chair)
Texas Forestry Association

Awards

Tony Squillace Award for the best presentation at SFTIC in 1995 and 1999
Inducted into Sigma Xi
Inducted into Gamma Sigma Delta
Other Activities and Responsibilities

Graduate faculty – currently serving on two committees
Committee member - Science and Outreach Advisory Committee for the USDA/IFAS Grant: Allele Discovery for Economic Pine Traits (ADEPT).
Member, Farm Services Advisory Committee.
Member, USDA-Forest Service Resistance Screening Center Steering Committee.
Served as reviewer for Forest Science, Canadian Journal of Forestry Research and Southern Journal of Applied Forestry.

Directs the activities of the Western Gulf Forest Tree Improvement Program - Pine. This program has 13 members encompassing the states of Arkansas, Louisiana, Mississippi, Oklahoma and Texas. The major efforts are to coordinate activities among members and supply the technical guidance required to conduct applied tree improvement programs. Applied research is conducted in many areas to support operational tree breeding programs.

Responsible for the direction of the Western Gulf Forest Tree Improvement Program - Hardwood. This program has 7 members in the states of Arkansas, Louisiana, Mississippi and Texas. Past efforts have been committed to preserving genetic material suitable for advance generation breeding, and producing interim seed supplies of improved strains of hardwood trees for reforestation efforts. Current efforts also involve projects to study natural regeneration problems and natural stand management in bottomland hardwoods.

Directs the Texas Forest Service Pine Tree Improvement Program. The tree improvement program and seed orchards produce three improved genetic varieties of loblolly pine, rust resistant slash pine, shortleaf pine, longleaf pine, and improved Virginia pine for Christmas tree production.

Leads the Texas Forest Service Urban Tree Improvement Program. This is a cooperative effort among the Texas Forest Service and municipalities and commercial nurseries in Texas. Major efforts are to develop improved strains of trees for urban environments.

Directs the Texas Forest Service Hardwood Tree Improvement Program. This program is designed to produce genetically superior hardwood seedlings for regeneration efforts.

Publications - Authored or coauthored:

Peer reviewed, refereed journal articles: 12
Invited presentations at national meetings: 10
Invited presentations at user groups: 8
Volunteer presentations at national meetings: 3
Volunteer presentations at regional meetings: 11
Book chapters: 1
Technical reports: 22
ZHIYONG CAI
Assistant Professor (Tenure-Track)
Department of Forest Science
Texas A&M University, College Station, TX 77843-2135
Ph: (979) 458-1417; Fax: (979) 845-6049; E-mail: z-cai@silva.tamu.edu

EDUCATION:
1993-1997 Ph.D. in Wood Science and Engineering, August 1997, Purdue University, USA.

PROFESSIONAL DEVELOPMENT:
   Passed Professional Engineer FE examination, Texas Board of Professional Engineer
   2003/04

PROFESSIONAL EXPERIENCE:
2001- Present Assistant Professor, (9/01–Present) Dept. of Forest Science, Texas A&M
   University.
   Present Appointment is 50% research and 50% teaching.
   2003- Present Collaborating Faculty Member: Dept. of Biological and Agricultural Engineering,
   Texas A&M University
   Corporation
   University
1993-1997 Graduate Research Instructor, (1/93 -- 6/97), Wood Research Lab., Purdue
   University
1988-1991 Graduate Research Assistant, (9/88 - 7/91), Nanjing Forestry University, China.
1990-1991 Teaching Assistant, (2/90 - 7/91), Nanjing Forestry University, China
1985-1998 Lecturer, (8/85 - 7/88), Jiangsu Telecommunication School, China

AWARD:
   Who's Who in Agriculture Higher Education (2003). Institutional Relations of
   AcademicKeys.

RESEARCH PROPOSAL
   Forest Product Co.
   Submitted to Forest Product Center, Louisiana State University.
Evaluation of Wood Floor System in Historical Buildings. (funded by US Department of Interior).

Hunt, M.O. and Z. Cai. 1997. Feasibility of Stress Wave Inspection of Wood Floors. (funded by Forest Products Lab.).

PUBLICATIONS (Selected):


MEMBERSHIP:

- Forest Products Society (FPS)
  Vice Chair – Division of Particleboard, Fiberboard & Model Products
- Society of Wood Science and Technology (SWST)
- American Society for Quality Control (ASQC)
- The International Society for Optical Engineering (SPIE)
- American Society of Mechanic Engineering (ASME)
- American Society of Nondestructive Testing (ASNT)
ROBERT N. COULSON
Department of Entomology and Forest Science,
Texas A&M University, College Station, TX 77843
Ph: 979/845-9725 FAX: 409/862-4820 E-Mail: r-coulson@tamu.edu
Knowledge Engineering Laboratory (KEL): http://kelab.tamu.edu/
R. N. Coulson: http://kelab.tamu.edu/coulson

Current Position: Professor, Department of Entomology and Department of Forest Science, and
Director of the Knowledge Engineering Laboratory, College of Agriculture and Life
Sciences.

Education: B.S., Biology, Furman University, 1965, M.S., Entomology, University of Georgia,
1967; Ph.D., Entomology, University of Georgia, 1969; Post Doctorate, Institute of
Ecology, University of Georgia, 1970.

Professional Societies:
Ecological Society of America, International Association of Landscape Ecology (IALE),
Entomological Society of America, Society of American Foresters, Americal Society of
Photogrammetric Engineering and Remote Sensing (ASPRS), International Union of
Forestry Research Organizations.

Professional Interests:
Science Specialties: insect ecology, landscape ecology, forest entomology, integrated pest
management, natural resource management.
Technical Specialties: knowledge engineering, computer-based problem-solving and
decision making, environmental science and management.

Honors & Awards:
Outstanding Achievement in International Programs - National Agricultural Research Program.
USDA, Organization of International Cooperation and Development.
A. D. Hopkins Award, Southern Forest Insect Work Conference.
Faculty Achievement Award for Research, Texas A&M University Former Student Association.
J. E. Bussart Award, Entomological Society of America.
Award of Merit in Recognition of Outstanding Achievements in Forest Research, Texas Forestry
Association.

Academic Responsibilities:
Principles of Insect Ecology (ENTO 424), Forest Protection (FRSC 307), Landscape Ecology
(ENTO/GEOG 625).

Summary of Current Funded Research Projects:
Restoration Planning and Evaluation Following Damage by the Southern Pine Beetle in a
Sustainable Forest Management Context.
Sponsor: USDA Forest Service, Forest Insect Research
Amount: $200,073
Duration: 2003-2004
PI: R. N. Coulson, Knowledge Engineering Laboratory; Co-PI: M. D. Tchakerian,
J. D. Waldron, Knowledge Engineering Laboratory; D. M. Cairns, C. Lafon
Department of Geography; K. Klepzig and D. Sloan, USDA Forest Service.
Objectives: The goal in this project is to develop a procedure to facilitate
restoration planning and evaluation in a sustainable forest management context.
The specific objectives are (1) to adapt the LANDIS forest simulation model for
use in SPB damage restoration planning and evaluation and (2) to apply the LANDIS model and develop a SPB damage restoration plan that can be implemented in a sustainable forest management context.

A Facilitated Workshop to Address Planning, Evaluation, and Monitoring A Southern Pine Beetle Research and Development Program.
**Sponsor:** USDA, CSREES, NI  
**Amount:** $28,400  
**Duration:** 2003  
**PI:** R. N. Coulson, Knowledge Engineering Laboratory  
**Objective:** To formulate a plan for a multi-state research project for the southern pine beetle by defining the research agenda and implementation plan.

Integrating GIS, GPS, and Mobile Mapping Technologies to Automate Survey and Monitoring of Forest Insects and Diseases: the southern pine beetle as a model system.
**Sponsor:** USDA Forest Service, Forest Health Protection.  
**Amount:** $62,000  
**Duration:** 2003-2004  
**PI:** R. N. Coulson, Knowledge Engineering Laboratory; Co-PI, M. D. Tchakerian, Knowledge Engineering Laboratory, D. F. Wunneburger, College of Architecture, S. R. Clarke and F. L. Oliveria USDA, Forest Service, Forest Health Protection.  
**Objective:** To develop a system for survey and monitoring of forest insects and diseases that integrates GIS, GPS, and mobile mapping technologies.

**Sponsor:** USDA APHIS, Texas Department of Agriculture  
**Amount:** $105,000 (and ca. $60,000 in computer hardware and software).  
**Duration:** 2003-2004  
**PI:** R. N. Coulson, Knowledge Engineering Laboratory; Co-PI, M. D. Tchakerian, Knowledge Engineering Laboratory, D. F. Wunneburger, College of Architecture, and J. A. Jackman, Department of Entomology.  
**Objective:** To develop and implement a computer application that facilitates mapping of survey data on pest species.

Evaluating the Impact of Southern Pine Beetle on Ecologically Sustainable Forest Management.
**Sponsor:** USDA Forest Service, Forest Health Protection  
**Amount:** $90,000  
**Duration:** 2000-2003  
**PI:** R. N. Coulson, Knowledge Engineering Laboratory; Co-PI, F. L. Oliveria, USDA Forest Service Forest Health Protection; Co-PI, D. F. Wunneburger, GeoInformatics Studio, College of Architecture.  
**Objective:** To define the impact of the southern pine beetle on the ecological processes that affect sustainability of forests.

Protection and Management of Honey Bees – Pollinators of Agricultural Crops, Orchards and Natural Landscapes.
**Sponsor:** TAES/Legislative Initiative  
**Amount:** $35,000
Duration: Annual
PI: R. N. Coulson, Knowledge Engineering Laboratory
Objective: To examine the roles of feral and managed honey bees as pollinators of agricultural crops, orchards, and natural landscapes.

Recent Publications


Computer Applications:
SPBEBE: Southern Pine Beetle Ecological and Biological Evaluation: A computer code to provide ecological and biological justification for Federal Funding of State insect suppression projects (1997).
ISPBEX-II--OOP/UNIX workstation version of the knowledge system environment for integrated pest management of the southern pine beetle (1994).
RiceFLEX, the rice weed advisor (1987). An expert system for herbicide recommendations for weeds in rice.
Marian Eriksson  
Associate Professor  
Department of Forest Science  
Texas A&M University  
College Station, TX 77843-2135  
Phone: 979-845-6638  E-Mail:<m-eriksson@tamu.edu>

SPECIALTY:  Forest Biometrics

EDUCATION:  Ph.D., Univ. of Minnesota, Forestry Resources, 1989.  
M.S., Univ. of California, Berkeley, Wildland Resource Science, 1981.  

PROFESSIONAL EMPLOYMENT:

1995 - present  Associate Professor, Department of Forest Science, Texas A&M University,  
College Station, TX
1989-1995  Associate Professor, Department of Forest Science, Texas A&M  
University, College Station, TX
1984-1989  Research Assistant / Teaching Assistant, Forest Biometrics  
Department of Forest Resources, University of Minnesota, St. Paul, MN
1983-1984  Research Associate, Forest Biometrics, Department of Forestry, Auburn  
University, Auburn, AL
1980-1983  Assistant Statistician, Department of Forestry and the Remote Sensing  
Research Program, University of California, Berkeley, CA.
1978-1980  Research Assistant, Forest Biometrics, Department of Forestry and the  
Remote Sensing Research Program, University of California, Berkeley, CA.

Research INTERESTS:  
Broadly, the application of mathematical, statistical, and computational methods to the  
quantification of forest and related resources. Current activities focus on inventory design  
and analysis, especially the development of areal estimators and the properties of those  
estimators and the development of the annualized inventory system replacing the Forest  
Inventory and Analysis system; spatial modeling and spatial statistics including both  
theoretical development and applications to the study of natural resources; the use of remote  
sensing, GIS, GPS and related technologies for resource assessment; the use of random  
coefficient and measurement error models.

PUBLICATIONS (last 5 years):

Williams, M. S. and M. Eriksson.  2002. Comparing the two paradigms for fixed-area sampling.  


99

**WEB SITES DEVELOPED:**

http://tapc.tamu.edu, for serving course web sites. ASP and database driven to support providing course materials as well as the submission of course work. Similar in concept to WebCT.

http://tapc.tamu.edu/nasf fire reporting, for serving the NASF Fire Reporting Web Site. Used by state foresters or state fire chiefs for uploading quarterly fire data bases (any format) and for creation of reports from these data.

**PUBLICATIONS – PENDING:**

**Eriksson, M.** An examination of the mapped-plot design using a randomization-based associative paradigm. To be submitted to *Forest Biometrics, Modelling and Information Sciences*

**Eriksson, M.** Randomization-based optimal weights in an annualized inventory. *Forest Science*. To be submitted to *Forest Biometrics, Modelling and Information Sciences*

**Eriksson, M., C-D Lin and S. Wang.** Finite population regression: comments and an estimator. To be submitted to either *Survey Methodology* or to the *Journal of the American Statistical Association*. 
M Nurul Islam-Faridi

Research Molecular Cytogeneticist (Plants)
Forest Tree Molecular Cytogenetics Laboratory (USDA-FS)
1042 Agronomy Rd., Forest Sciences Bldg., Texas A&M Univ.,
College Station, TX 77843
Tel: 979-862-3908 (O), Lab: 979-845-4622 (Lab)
Fax: 979-845-3272, Email: nfaridi@tamu.edu or nfaridi99@hotmail.com

EDUCATION

<table>
<thead>
<tr>
<th>Degree</th>
<th>Field</th>
<th>Institution</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ph.D.</td>
<td>Genetics/Cytogenetics</td>
<td>Univ. of Cambridge, UK</td>
<td>1988</td>
</tr>
<tr>
<td>M.Phil.</td>
<td>Plant Breeding</td>
<td>Univ. of Cambridge, UK</td>
<td>1984</td>
</tr>
<tr>
<td>B.Sc.Ag. (Hons.)</td>
<td>Major in Genetics &amp; Plant Breeding</td>
<td>Agric Univ., Mymensingh, Bangladesh</td>
<td>1976</td>
</tr>
</tbody>
</table>

PROFESSIONAL HISTORY

July '03 – Now Research Mol. Cytogeneticist, USDA-FS, Southern Research Station, Texas A&M University, College Station, Texas.

Aug '94 – June '03 Assoc. Research Scientist, Dep. Soil & Crop Sciences, Texas A&M University, College Station, Texas.


Oct '83 – Nov '88 Graduate student, University of Cambridge and Plant Breeding Institute (PBI), Cambridge, England, UK.

July '77 – Lecturer and Assist. Professor, Dept. Genetics & Plant Breeding, Agricultural University, Mymensingh, Bangladesh.

SOCIETY MEMBERSHIP

- Member, Wolfson College, University of Cambridge, Cambridge, England, UK.
- Member, American Association for the Advancement of Science (AAAS), Marion, Ohio, USA.
- Member (Life), Plant Breeding & Genetics Society of Bangladesh (PBGSB), Dhaka, Bangladesh.
- Member (life), Philippines Association of Research Manager, University of the Philippines, LosBanos, Philippines.
- Fellow (Life), Cambridge Philosophical Society, University of Cambridge, Cambridge, England, UK.

PUBLICATIONS Since Texas A&M affiliation


Islam-Faridi MN, Kim JS, Klein PE, Stelly DM, Price HJ, Klein RR and Mullet JE. 2004. Sorghum chromosome 3 is larger than rice chromosome 1 due to expansion of pericentromeric heterochromatin. PNAS (Submitted)
RUSSELL A. FEAGIN
Department of Forest Science, Texas A&M University
2135 TAMU, College Station, TX 77843-2135
(979) 862-2612 (Phone) (979) 862-2607 (Fax) feaginr@tamu.edu (Email)

Professional Preparation

- B.A. Environmental Studies, University of California, Santa Cruz, June 1996
- Ph.D. Rangeland Ecology and Management, Texas A&M University, May 2003

Appointments

2004-present  Assistant Professor (non-tenure track), Spatial Sciences Laboratory, Texas Agricultural Experiment Station, Texas A&M University

Visiting Assistant Professor, Department of Forest Science, Texas A&M University

2003  Visiting Assistant Professor, Department of Rangeland Ecology and Management, Texas A&M University

Publications


Abstracts/Symposia/Invited


Book Reviews/Other Publications


Research Grants/Contracts

• "Hypothesis testing with geostatistics and the emergence of spatial patterns among interacting plants", $500, Office of Graduate Research, Texas A&M University, 2002, PI.

Computer programs


Courses Taught

• RLEM 689 Landscape Ecology and Conservation (graduate level, 8 students)
• RENR 205 Fundamentals of Ecology (undergrad level, 500 students)
• RENR 215 Fundamentals of Ecology Lab (undergrad level, 28 students)
• RENR 215 Coordinator (coordinate 8 TAs with 196 students)
• FRSC 461 Geogr. Inform. Sys. for Resource Managers (undergrad level, 36 students)
• FRSC 651 Geogr. Inform. Sys. for Resource Managers (graduate level, 13 students)

Professional Activities and Honors

• Chair, Awards Committee, Sigma Xi, Texas A&M Chapter, 2003-2004. Also member of Awards Committee 2002-2003.
• Distinguished Graduate Student Teaching Award, Association of Former Students, Texas A&M University, College Station, 2003.
- Wasko Fellow, Texas A&M University, Department of Rangeland Ecology and Management, 2002-2003.


- Membership of Professional Societies
  0 New England Complex Systems Institute (NECSI)
  0 International Association of Landscape Ecologists (IALE)
  0 Ecological Society of America (ESA)

- Membership of Honor Societies
  0 Phi Kappa Phi Honor Society
  0 Gamma Sigma Delta, International Honor Society of Agriculture
  0 Sigma Xi, The Scientific Research Society

- Reviewer: Ecological Complexity, Ecology

- Volunteer Organizer, Ecological Society of America (ESA) 2002 Conference

- Volunteer, Yale University Press, 2003

RESUME  Clarence Darwin Foster

POSITION:  Associate Head and Extension Program Leader
          Associate Professor
          Department of Forest Science
          Texas A&M University
          College Station, TX 77843-2135

PHONE:  979-845-1351
E-Mail:  cdfoster@tamu.edu

SPECIALTY:  Silviculture, Ecology and Soils

EDUCATION:  Ph.D., Stephen F. Austin State University, Forestry, 1985.
            M.F., Stephen F. Austin State University, Forestry, 1968.
            B.F., Stephen F. Austin State University, Forestry, 1967.

PRIZES OR HONORS:
Team member, Institute of Renewable Natural Resources, Texas A&M University, 2002
Outstanding Achievement Award from the Renewable Resources Foundation for the Natural
Resources Leadership Course for County Extension Agents, November 2002.

GRADUATE STUDENT COMMITTEE RESPONSIBILITIES:
Stephen F. Austin State University:
Currently serving as Adjunct Professor in the Arthur Temple College of Forestry and
member of the Graduate Faculty, Stephen F. Austin State University, Nacogdoches, TX.
Served on graduate committees for the following:

Qingzhou Li, Doctor of Philosophy, August 2000. Monitoring Changes in Landscape
Patterns of the Angelina National Forest, East Texas.

Bobby G. Eichler, Master of Science in Forestry, August 1999. Nesting and Brood Rearing
Habitat of Eastern Wild Turkeys in East Texas.

Xiangwan Liu, Doctor of Forestry, December 1995. Survival, Movement, and Habitat
Selection of Relocated and Resident Northern Bobwhite in East Texas.

David Scott Parsons, Master of Science in Forestry, December 1994. Nesting, Brood Habitat,
and Utilization of Planted Food Plots by Northern Bobwhite in East Texas.

Texas A&M University:
PROFESSIONAL EMPLOYMENT:
Jan 2002 - present  Associate Head and Extension Program Leader, Department of Forest Science, Texas A&M University, College Station, Texas
1999 - 2001  Manager, Pine Research, Temple-Inland Forest Products Corp., Diboll, Texas
1996 - 1999  Director, Research, Temple-Inland Forest Products Corp., Diboll, Texas
1985 - 1996  Manager, Land Services, Temple-Inland Forest Products Corp., Diboll, Texas
1979 - 1985  Director, Administration, Temple-Inland Forest Products Corp., Diboll, Texas
1976 - 1979  Assistant Manager, Forest Management, Temple-Inland Forest Products Corp. Diboll, Texas
1972 - 1976  Assistant Manager, Technical Control, Temple-Inland Forest Products Corp., Diboll, Texas
1968 - 1972  Research Forester, Temple-Inland Forest Products Corp., Diboll, Texas

PUBLICATIONS:


JIANBANG GAN
Department of Forest Science, Texas A&M University, College Station, Texas 77843-2135
Tel.: (979) 862-4392, fax: (979) 845-6049, email: j-gan@silva.tamu.edu

EDUCATION
Doctor of Philosophy, 1990, Forestry (Economics), Iowa State University
Master of Science, 1988, Forestry (Economics and Marketing), Iowa State University
Bachelor of Science, 1982, Forestry, Fujian Agriculture and Forestry University, China

PROFESSIONAL EXPERIENCE
Associate Professor - Forest Economics and Policy, 2001 – present
Joint appointment in the Department of Agricultural Economics
Texas A&M University, College Station, TX

Professor - Forestry/Agricultural and Natural Resource Economics, 1999 - 2001
Associate Professor - Forestry/Agricultural and Natural Resource Economics, 1997 - 99
Assistant Professor - Forestry/Agricultural and Natural Resource Economics, 1992 - 97
Coordinator for International Project Development, 1992 - 2001
Coordinator for Forest Resources Program, 1998 - 2001
Tuskegee University, Tuskegee, AL

Postdoctoral Research Associate - Forest Economics and Policy, 1991 - 92
Iowa State University, Ames, IA

Instructor - Forestry, 1982 - 1986
Fujian Agriculture and Forestry University, China

SELECTED GRANTS
Awarded more than 15 grants and contracts valued at over $1.8 million
(1) Effects of climate change, forest certification, biotechnology, and industrial concentration on the US forest products industry and trade, USDA NRICGP, $175,000, 2003-2006 (PD)
(2) Improving income of socially disadvantaged forestland owners in the South through technical assistance, USDA Fund for Rural America Competitive Grants Program, $150,000, 1998-2002 (PI)
(3) Impact assessment of free trade policies on the US forestry sector and southern timber-dependent rural communities, USDA CSREES, $269,962, 1997-2001 (PI)
(4) Ecological-economic assessment of forest ecosystem management regimes, USDA Forest Service (FS), $93,000, 1994-2000 (PI)
(5) Agriculture-based natural resource research in Senegal, USAID (through Oregon State University), $75,479, 1997-98 (PI)
(6) Sustainable agriculture and natural resource management in Africa, Asia, and Latin America, USAID, $400,000, 1992-2001 (Project Coordinator)

GRADUATE STUDENT SUPERVISION
Chair/co-chair: 2 Ph.D. committees and 10 M.S. committees
Member: 25 graduate committees; Graduate Council Representative: 2 Ph.D. committees
PROFESSIONAL AFFILIATIONS
Society of American Foresters
Southern Forest Economics Workers Association
Gamma Sigma Delta Agricultural Honor Society
Texas Forest Association
Phi Kappa Phi Honor Society
Xi Sigma Pi Forestry Honor Society

OTHER PROFESSIONAL EXPERIENCE
Consulting and Overseas Experience:
Consultant Marketing analysis of African processed wood product exports to the US (USAID)
Research China Agricultural University (Invited by China’s Ministry of Agriculture)
Asian Institute of Technology, Bangkok, Thailand
Community-based natural resource management in Tanzania
Sustainable agriculture and natural resource management in the Philippines
Lecture Fujian Agriculture and Forestry University; Nanjing Forestry University, China

Referee:
National Research Council National Science Foundation
USDA 1890 Institution Capacity Building Grants (Panelist) USDA NRICGP
The McGraw-Hill Companies Forest Science
Agroforestry Systems Forest Policy & Economics
Canadian Journal of Forest Research Southern Journal of Applied Forestry
Journal of Agricultural and Applied Economics Journal of Tropical Forest Science
Environmental Conservation (An International Journal of Environmental Science)

SELECTED PUBLICATIONS
Gan, J. “Risk and Damage of Southern Pine Beetle Outbreaks under Global Climate Change.” Forest Ecology and Management, in press.


JEAN H. GOULD

PERSONAL:
Assistant Professor, Research
Department of Forest Science

EDUCATION
Ph.D. Plant Physiology, University of California - Riverside
B.A. Liberal Arts & Sciences, University of Illinois - Champaign/Urbana

POSITIONS HELD & APPOINTMENTS
1998-P Assistant Professor, Research, Forest Science Dept., Texas Ag. Exp. Station (TAES)
2001-02 Visiting Assistant Professor, Forest Sciences Dept. Texas A&M University
1993-98 Associate Research Scientist, Department of Forest Science, TAES

RESEARCH PROJECT (Hatch Project TEX 8458)
Improvement of Crop Plants and Forest Trees Through Genetic Engineering: Model & non-model plant species:
Cotton: *Gossypium hirsutum; G. barbadense*, silencing gossypol production in cottonseed
Cereals/Grasses: *Zea mays* (corn), *Oryza sativa* (rice), *Sorghum bicolor*, *Triticum aestivum*, *Zoysia*
Pines: *Pinus spp.*: loblolly, afghan, *Virginia* & radiata pines
Gene expression and genetic silencing, hormonal regulation of plant development and secondary products, phytochemicals in human health, plant defense & stress mechanisms, phyto-remediation - detoxification of environmental pollutants, sustainable agriculture

HONORS
Sigma Xi, Science and Engineering, 1983
Gamma Sigma Delta, Agriculture, 1997
Biography in Marquis Who's Who in the World, 18th Ed. 2001
Biography in Marquis Who's Who in Science and Engineering, 2nd Ed. 1989

PROFESSIONAL MEMBERSHIPS
American Association for the Advancement of Science, AAAS
American Society of Plant Biology (formerly American Society of Plant Physiology), ASPB
American Society of Cell Biology, ASCB
International Society for Plant Molecular Biology, ISPMB

TEACHING
*Plant Cell Culture in Crop Improvement, lecture + laboratory (MEPS/FRSC 650)*
Directed Research, MEPS 691, GENE 691, FRSC 691

GRADUATE STUDENTS
Marianne Arnold PhD MEPS 2002-P
Hui Mei PhD MEPS 2002-P
Arman Kopybayev  MS MEPS  Comparison of biolistic and Agrobacterium-mediated genetic transformation of immature and mature embryos of spring wheat cultivar ‘Saratovskaya-29’, 2004 TAMU


SERVICE
2002-P  Council of Principal Investigators, Executive Committee
2002-P  Co-Chair, Molecular & Environmental Plant Sciences (MEPS) Graduate Program
2000-P  Chair, Graduate Admissions, MEPS
2000-P  Executive Committee, MEPS
2000-01  Graduate Advisor, MEPS
2000  Review Panel, NSF Plant Genome, Washington DC

SELECTED PUBLICATIONS


**INTELLECTUAL PROPERTY**


**FUNDING**
2003-2004 I-4 Breeder Driven Molecular Program for Monocots.
1997-1999 THECB-ATP Transformation of Texas genotypes for insect Resistance
1995-1997 THECB-ATP Transformation of Commercial Plant Genotypes for Texas
1994-1997 US EPA Risk Assessment of transgenic plants developed for remediation of polluted sites
NAME AND ADDRESS: Carol A. Loopstra  
Dept. of Forest Science and  
Institute for Plant Genomics and Biotechnology  
Texas A&M University, TAMU 2135  
College Station, TX 77843-2135  
(979) 862-2200; FAX (979) 862-4790  
e-mail: c-loopstra@tamu.edu

PROFESSIONAL PREPARATION  
Oregon State University, Forest Management, B.S. 1979  
Oregon State University, Forest Science, M.S. 1984  
North Carolina State University, Forestry and Genetics (co-majors), Ph.D. 1992  
Griffith University (Brisbane, Australia), Forest Biotechnology, 1992-1993  
University of Queensland, Forest Biotechnology, 1993-1994

APPOINTMENTS:  
2002 – present, Associate Head for Graduate Program, Dept. of Forest Science, Texas A&M University  
2001 – present, Associate Professor, Dept. of Forest Science, Texas A&M University  
2000 – present, Faculty – Professional Program in Biotechnology, Texas A&M University  
1995 – present, Faculty of Genetics, Texas A&M University  
1995 – present, Faculty of Molecular and Environmental Plant Sciences, Texas A&M University  
1995 – 2001, Assistant Professor, Dept. of Forest Science, Texas A&M University  
1992 – 1994, Postdoctoral Scholar, Griffith University / University of Queensland  
1984 – 1990 Biologist, USDA Forest Service, Institute of Forest Genetics, Berkeley, CA

CURRENT TEACHING:  
GENE 411 / MEPS 411 – Biotechnology for Crop Improvement, TAMU, 1997 – present  
FRSC 203 – Dendrology, TAMU, 2000 – present  
FRSC 620 – Current Issues in Forest Science – 2 weeks/semester taught - 2003  
FRSC 308 – Tree Structure and Function – 2 weeks/semester taught - 2004

REFEREED PUBLICATIONS


**CHAPTERS IN BOOKS - RECENT (6 TOTAL):**


**RESEARCH GRANTS**

Agency: Texas Higher Education Coordinating Board – Advanced Technology Program
Title: Drought tolerant pines for Texas forests.
Carol Loopstra, PI ; $160,000, Jan. 2002 – Aug. 2004

Agency: National Science Foundation - Plant Genome
Title: Wood formation in loblolly pine.
Multi-institutional. Ronald Sederoff(NCSU) PI.; Carol Loopstra, Co-PI

Agency: USDA ARS – Fund for Rural America
Title: Conservation and utilization of pecan genetic resources.

Agency: International Arid Lands Consortium
Title: Influence of water deficit on gene products in Pinus halepensis.
Gabriel Schiller, Carol Loopstra, Leonid Korol and Ronald Newton, Co-PIs
Total $75,000; $35,000 to Carol Loopstra, May 1997 – April 2000.

Program: TAMU Interdisciplinary Research Initiatives Program
Title: Defining the colinearity between the poplar and arabidopsis genomes.
Carol Loopstra and Alan Pepper, Co-Pis $24,088; April 1999 – September 2000

Agency: USDA NRICGP – Plant Growth and Development
Title: Arabinogalactan-proteins in xylem development of loblolly pine.
Carol Loopstra, PI; $100,000, Sept 1995 – Sept. 1998.
MICHAEL G. MESSINA
Professor and Associate Department Head
Department of Forest Science, Texas A&M University, College Station, TX 77843-2135
(979) 845-2547, FAX: (979) 845-6049, e-mail: m-messina@tamu.edu

EDUCATION: 1979, B.S., Forest Science (with Distinction), The Pennsylvania State University, University Park
1983, Ph.D., Forestry, North Carolina State University, Raleigh

EXPERIENCE:
2001 – P  Professor, Department of Forest Science, Texas A&M University
1992 - 2001  Associate Professor, Department of Forest Science, Texas A&M University
1986 – 1992  Assistant Professor, Department of Forest Science, Texas A&M University
1983 - 1986  Postdoctoral Research Fellow, Forest Research Institute, New Zealand Forest Service

PROFESSIONAL INTERESTS:
Silviculture, forested wetland ecology and management, eco physiology, nutrient cycling, management effects on site quality, intensive pine stand management.

SELECTED GRANT SUPPORT: (Lifetime shared and individual support of $1,498,467)
SELECTED PUBLICATIONS:
Messina, M.G. Cultural treatments affect early loblolly pine (Pinus taeda L.) survival, growth, fascicle morphology, and water relations on a harsh Texas site. Southern Journal of Applied Forestry. Provisionally accepted; under revision.
SORIN C. POPESCU
Spatial Sciences Laboratory
Assistant Professor Department of Forest Science, Texas A&M University
1500 Research Parkway, Suite B223
College Station, TX 77845, USA
email: s-popescu@tamu.edu; website: http://www.ssl.tamu.edu
Phone: (979) 862-2614, Fax: (979) 862-2607

EDUCATION
PH.D. (May 2002) Forestry, Dept. of Forestry, Virginia Tech
• Dissertation: “Estimating plot-level forest biophysical parameters using airborne lidar measurements”
• GPA: 3.98 / 4.00

DIPLOMA DEGREE, FOREST ENGINEER “Transilvania” University of Brasov
June 1992 Faculty of Forestry, Brasov, Romania

PEER-REVIEWED PUBLICATIONS


COURSEWARE DEVELOPMENTS AND TEACHING ACTIVITY
Interpretation of Aerial Photographs (FRSC 398)
Remote Sensing in Renewable Natural Resources (REN R 444)
Remote Sensing for Natural Resources Management (FRSC 608)
Advanced Remote Sensing (FRSC 661)

HONORS AND GRANTS
Lidar Remote Sensing of Forest Fuel Loads and Fire Risk Assessment in Texas: Award #:
02-DG-1100148-050 with Texas Forest Service, 2003-2005
3rd place Fourth Annual Geospatial Solutions Applications Contest 2003
NASA Earth System Science Fellowship, September 1999 – 2002
American Society for Photogrammetry and Remote Sensing (ASPRS) Graduate Student Award 2002 – LH Systems Internship Award (at Leica Geosystems, San Diego, CA)
ASPRS – Potomac Region and North Carolina Chapter Student Scholarship 2002
NASA Graduate Student Summer Program, June – July 1998

RESEARCH INTERESTS
Remote sensing applications for assessing natural resources, forest inventory, forest fire risk assessment and fuels mapping, precision forestry, land use and land cover change, forest carbon sources and sinks, urban forest inventory, and global environmental change

Lidar remote sensors, airborne and satellite remote sensing, multisensor data fusion, algorithm development for automated image processing, DEM generation, vegetation extraction and assessment

PROFESSIONAL EXPERIENCE
JULY 2003 – PRESENT Assistant Professor, Spatial Sciences Laboratory
  Department of Forest Science, Texas A&M University
AUGUST 2002 – PRESENT Postdoctoral Research Associate,
  Department of Forestry, Virginia Tech, USA
AUGUST 1997 – MAY 2002 Graduate Research and Teaching Assistant
  Department of Forestry, Virginia Tech, USA
JUNE-AUGUST 1997 GIS Analyst
  Canadian Geomatic Solutions Ltd., Calgary, Alberta, Canada
JUNE - AUGUST 1996 Research Assistant
  Department of Forest Biometrics, University of Freiburg, Germany
SEPTEMBER 1992 - Assistant Lecturer
MAY 1997 “Transilvania” University of Brasov,
  Department of Forest Management, Romania

PROFESSIONAL AND HONOR SOCIETY MEMBERSHIP
American Society for Photogrammetry & Remote Sensing
Society of American Foresters (SAF)
Xi Sigma Pi, The Honor Society of Forestry

REVIEWS

PUBLICATIONS – SELECTED CONFERENCE PROCEEDINGS
COMPUTER SKILLS FOR IMAGE PROCESSING AND GIS

Programming Languages: IDL, C/C++ (object oriented level), Visual Basic, Avenue, AML, Perl

Applications software: ENVI, ERDAS Imagine, ArcGIS, Terrascan, Bentley Microstation, SAS
RESUME

Charles Tattersall Smith, Jr.

POSITION: Professor and Head
Department of Forest Science
Texas A&M University
College Station, TX 77843-2135

PHONE: 979-845-5000
E-Mail: tat-smith@tamu.edu

SPECIALTY: Forest Ecology and Soils

EDUCATION: Ph.D., Univ. of Maine, Forestry, 1984.
M.S., Univ. of Vermont, Forestry, 1978.
B.A., Univ. of Virginia, Economics, 1972.

PROFESSIONAL EMPLOYMENT:

Jan 1999 - present Professor and Head, Department of Forest Science, Texas A&M
University, College Station, Texas
July - Dec 1998 Project Leader, Sustainability and Environmental Research and
Manager, South Island Operations, New Zealand Forest Research Institute
Limited, Christchurch, New Zealand
1993 - 1998 Programme Manager, Soil and Site Productivity Group, New Zealand
Forest Research Institute Limited, Rotorua, New Zealand
1991 Visiting Senior Fellow, Forest Research Institute, Rotorua, New Zealand
1989-1992 Associate Professor of Forest Ecology and Soils, Department of Forest
Resources, University of New Hampshire, Durham, NH
1984-1989 Assistant Professor, Department of Forest Resources, University of New
Hampshire, Durham, NH
1982 - 1984 Instructor of Forest Resources, Department of Forest Resources,
University of New Hampshire, Durham, NH
1978 - 1982 Research Assistant, College of Forest Resources, University of Maine,
Orono, ME
1976 - 1977 Research Assistant, School of Natural Resources, University of Vermont,
Burlington, VT

Selected publications (last 5 years):

Editor/Compiler
forestry and bioenergy in densely-populated regions”. Proceedings of the IEA Bioenergy
Task 31 workshop, Garderen, The Netherlands, 16-21 September 2001. Biomass and
Bioenergy 24 (4-5).


Book chapters


Refereed Journal Articles


RAGHAVAN SRINIVASAN
Director and Associate Professor, Spatial Sciences Lab and Blackland Research Center
Texas A & M University System
E-mail: srin@brc.tamus.edu  www: http://www.brc.tamus.edu/srin
Tel: 979-845-5069  Fax: 979-862-2607

PROFESSIONAL PREPARATION
- M.S. AGRICULTURAL ENGINEERING, ASIAN INSTITUTE OF
  TECHNOLOGY (BANGKOK), 1989.
- B.E. AGRICULTURAL ENGINEERING, TNAU (INDIA), 1984.

Appointments
- 2000 August – Present Director, Mapping Science Laboratory, TAMU, College Station, TX.
- 1999 April – July 2000 Assistant Director, Mapping Science Laboratory, TAMU, College Station, TX.
- 1999-Present Associate Professor, TAES, Temple, TX.
- 1996-1998 Assistant Professor, TAES, Temple, TX.
- 1992-1996 Agricultural Engineer and Associate Research Scientist, TAES, Temple, TX.
- 1989-1992 Graduate Research Assistant, Purdue University, W. Lafayette, IN.

Publications
   evapotranspiration from NOAA-AVHRR satellite. Applied Engineering in Agriculture.
   composite techniques using NOAA-14 AVHRR data. International Journal of Remote
   Sensing. 24(17): 3403-3412.
   detection method for daily NOAA-14 AVHRR data for Texas, U.S.A. International Journal
   Validation of the SWAT model on a large river basin with point and nonpoint sources. J.
   quality assessment with agro-environmental indexing of non-point sources, Trinity River
   base flow and groundwater recharge in the Upper Mississippi river basin. J. Hydrology. 227:
   21-40.
   scale simulation of the hydrologic balance. J. American Water Resources Association 35(5):
   1037-1052.

SYNERGESTIC ACTIVITIES
Real-Time Hydrological Drought Information system: Research is in progress for establishing a real-time Hydrological Drought Information System, by integrating information from NOAA-AVHRR satellites and NEXRAD radar with GIS. User friendly models and an early warning drought management system will be developed to provide insight into mitigation opportunities. As part of the effort, statewide satellite and radar data are collected and synthesized to calculate indices reflecting vegetation health and other attributes. Results are distributed via the World Wide Web (http://webgis.tamu.edu).
HUMUS: This is a national scale project developed to analyze management scenarios to support 1997 Resource Conservation Appraisal (RCA) using SWAT and GIS. The HUMUS (Hydrologic Unit Model for the United States) project improves on existing technologies for making national and regional water resource assessment considering both current and projected management conditions. A GRASS-GIS interface has been developed for developing model inputs and analyzing model outputs of SWAT (Soil and Water Assessment Tool). Recently an ArcView GIS interface has been developed for SWAT model.
BASINS: In this project, user-friendly spatial tools for extraction of model input data are developed for USEPA’s BASINS. The spatial tools are developed for automatic watershed delineation with many flexible configurations from DEMS, computing subwatershed parameters like soil and land use definitions, and input of point sources and reservoirs. Grid projection tool allows the user to convert the GIS database from one projection to another as needed. The spatial tools allow the model users to use either the available data or input their own data and do the necessary processing and simulation.
School of Rural Public Health: An information system has been developed incorporating many of the data management and analytical techniques for natural resource applications. Tools are developed to query, analyze, and map health-related databases for local and global Internet access. Dr. Srini is involved with Blackland scientists in directing the informatics component of an initiative, led by the TAMUS School of Rural Public Health for assisting local physicians to examine health data. A Web Site has been developed that provides tools to analyze Public Health in Texas using Health, Social, Economic, Demographic, and Environmental Databases (http://srph.brc.tamus.edu).

PROFESSIONAL, SCIENTIFIC AND HONOR SOCIETY ACTIVITIES
American Society of Agricultural Engineers (ASAE).
American Water Resources Association (AWRA).
Associate Editor for Journal of American Water Resource Association
DAVID MATTHIAS STELLY
TAMU, College Station, TX 77843-2474, stelly@tamu.edu

i. Professional Preparation

<table>
<thead>
<tr>
<th>Institution</th>
<th>Major</th>
<th>Degree (Year)</th>
<th>Advisor</th>
</tr>
</thead>
<tbody>
<tr>
<td>UW-Madison ♦ Iowa</td>
<td>Genetics</td>
<td>B.Sc. (1975)</td>
<td>James F. Crow</td>
</tr>
<tr>
<td>State</td>
<td>Plant Breeding &amp;</td>
<td>M.Sc. (1979)</td>
<td>Reid G. Palmer</td>
</tr>
<tr>
<td>Madison</td>
<td>Plant Genetics</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

ii. Professional Appointments

- Professor, Faculty of Molecular & Environmental Plant Sciences: 2000-present
- Professor, Dept. Forest Sciences FRSC: 1997-2000 (joint appt.)
- Professor, Dept. Soil & Crop Sciences (SCSC), and Faculty of Genetics (GENE): 1993-present
- Director, Laboratory for Plant Molecular Cytogenetics (LPMC): 1996-present
- Associate Professor, Dept. Soil & Crop Sciences (SCSC), and Faculty of Genetics (GENE): 1989-1993
- Assistant Professor, Dept. Soil & Crop Sciences (SCSC), and Faculty of Genetics (GENE): 1983-1989

iii. Publications: (i) Five Most Closely Related to Proposed Research:


iv. Five Other Significant Publications:


Zwick MS, Islam-Faridi MN, Zhang HB, Hodnett GL, Gomez MI, Kim JS, Price HJ, Stelly DM. 2000. Distribution and sequence analysis of the centromere-associated repetitive element CEN38 of Sorghum bicolor (Poaceae). Am J Bot. 87: 1757-1764. (Demonstrated ability repetitive element FISH to reveal polyploid ancestry in a manner that is highly efficient and, at least in some cases, more readily than linkage mapping.)


Synergistic Activities:
1. K-12: Co-organized campus Biotechnology Research Tours for middle school kids for several years.
3. International and Collaborative Research:
   - Shared biological and intellectual materials with the public:
     - Cotton Cytogenetics Collection: Develop and share unique cytogenetic stocks.
     - Germplasm release: 14 disomic chromosome substitution lines (awaiting federal approval).
     - Radiation Hybrid DNA Panels: Plan to distribute whole-genome radiation hybrid panels from G. hirsutum (5-krad) and G. barbadense (8-krad).
   - Chiasmate Region Analysis Program: An EM-based MLE algorithm for chiasmate region analysis:
     - http://library.wolfram.com/infcntr/MathSource/749/
4. Contributor to Research Vision:
   - 1st animal genomics poster at Plant Genome Conf. (see http://www.intl-pag/pag/4/abstracts/p91.html)
   - Cytogenetics and Molecular Cytogenetics workshops at PGC (1997), and CSSA (co-developed / B. Gill)
6. Institutional - Education: I teach 2-3 courses per year; train 2-5 graduate students and 0-2 undergraduates
   - GENE 620 Cytogenetics (graduate lecture). http://www.tamu.edu/genetics/classes/gene620.htm
   - AGRO 603: Graduate lecture/lab. Cytological preps, microscopy, photomicroscopy, digital imaging.
   - GENE 681 Graduate Journal Club on plant genomics and genetics.
7. Institutional – Facilities & Training: Open-use policy for on-campus researchers to use our digital imaging epi-fluorescence microscopy facilities for their research. Current users:

Collaborators & Other Affiliations (To save space, known co-institutional conflicts are not listed, as they are excluded anyway)

<table>
<thead>
<tr>
<th>Abbey, C. (TAMU?)</th>
<th>Jenkins, Johnie (USDA)</th>
<th>Syed, NH (TAMU?)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bell, Alois (USDA)</td>
<td>Ji, Yuanfu (UC-Davis)</td>
<td>Tang, Hongsheng (Cornell U)</td>
</tr>
<tr>
<td>Brennan, R.A. (TAMU?)</td>
<td>Karaca, M. (Miss. St. U.)</td>
<td>Tao, Quanzhou (Commercial)</td>
</tr>
<tr>
<td>Bridgewater, Floyd (USDA)</td>
<td>Kharb, Pushpa (?)</td>
<td>Taylor, Jeremy F. (U MO)</td>
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<td>Burr, Benjamin (BNL)</td>
<td>Klein, Robert (USDA)</td>
<td>Wang, Bin (TAMU)</td>
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<tr>
<td>Cantrell, Roy (Cotton Inc.)</td>
<td>Kohel, Russel J (USDA)</td>
<td>Wang, Jingzhao (TAMU)</td>
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<tr>
<td>Chang Yeuh Long (TAMU?)</td>
<td>Lee, H-S. (TAMU?)</td>
<td>Wendel, Jonathan (ISU-Ames)</td>
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<td>Chen, Huaming (Salk Inst.)</td>
<td>McCarty, Jack (USDA)</td>
<td>Wilkins, Thea (UC-Davis)</td>
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<td>Crane, Charles (Purdue)</td>
<td>Mei, Minghua (TAMU?)</td>
<td>Wu, Jixiang (MSU)</td>
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<td>Davis, Scott K. (?)</td>
<td>Nelson, Dana (USDA)</td>
<td>Yan, B. (TAMU?)</td>
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<td>De Donato, Marcos (Venez.)</td>
<td>Paterson, Andrew (UG)</td>
<td>Yan, R. (TAMU?)</td>
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<td>Decanini, Laura (USDA?)</td>
<td>Percival, Edward (USDA)</td>
<td>Yu, John (USDA)</td>
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<td>Dolezel, Jaroslav (Czech State)</td>
<td>Percy, Richard (USDA)</td>
<td>Zhang, Liangtao (NZ)</td>
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<td>Gallagher, Daniel..S. Jr., (?)</td>
<td>Ren, C (TAMU)</td>
<td>Zhao, Xingping (MSU)</td>
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<td>Gao, Wuxiang (U GA)</td>
<td>Reyes-Valdes, M. H. (MX)</td>
<td>Zipf, Alan. (AAMU)</td>
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<td>Gill, C. (TAMU?)</td>
<td>Robinson, Forest (USDA)</td>
<td>Zwick, Michael (CEO)</td>
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<td>Gutierrez, Osman A. (USDA)</td>
<td>Saha, Sukumar (USDA)</td>
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<td>Islam-Faridi, M Nurul (USDA)</td>
<td>Stipanovic, Robert (USDA)</td>
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<tr>
<td>Jackson, Lisa E. (TAMU?)</td>
<td>Syed, Naeem H. (Dundee)</td>
<td></td>
</tr>
</tbody>
</table>
ERIC LEE TAYLOR
Assistant Professor & Extension Specialist – Forestry
Texas Cooperative Extension
eric-taylor@tamu.edu

EDUCATION AND EXPERIENCE

Education
M.S., 1990, Stephen F. Austin State University, Forest Biometrics.
B.S., 1988, Stephen F. Austin State University, Timber Management.

Experience
2002 to Present: Assistant Professor and Extension Specialist, Texas Cooperative Extension, 100% Extension appointment.
2000: Interim Associate Department Head and Extension Program Leader for Forestry.

Grants and Contracts
“Eastman Outdoors: Wildlife Habitat Program,” $8000 contract to develop “Eastman Outdoors” web site to support outdoor program.

Publications
Taylor, E.L., and Jay Tate, 2002. “Pine Straw as a Ground Cover Mulch.” Department of Forest Science, Texas A&M University, Publication 805-111.

Popular Articles, Workbooks, and Video

Invited Presentations
“High Tech Tools for Forest Landowners.” Presentation delivered to Trinity County Forest Landowners Association’s quarterly meeting. Trinity, TX, April 2003.

“Seedling Survival Strategies.” Program delivered to Trinity County Forest Landowners Association’s quarterly meeting. Trinity, TX, January 2002.

“Green Certification.” Program presented to the Gregg/Harrison County Forest Landowner Association’s quarterly meeting. Marshall, TX, January 2002.


“Site Preparation, Seedling Care and Proper Planting.” Presented to the Houston County Forest Landowners Association’s quarterly meeting. Crockett, TX, April 2001.

“Site Preparation, Seedling Care and Proper Planting.” Presented to the Upshur County Forest Landowners Association’s quarterly meeting. Gilmer, TX, April 2001.


“New Forestry Practices.” Program presented to the Polk County Forest Landowner Association’s quarterly meeting. Cleveland, TX, March 2001.


“Agroforestry Alternatives.” Program presented to the Shelby County Forest Landowners Association’s quarterly meeting. Center, TX, October 2000.


“Setting up a Web Site.” Program presented at the Texas Christmas Tree Growers Annual Conference. Athens, TX, 1999.

“Site Preparation for Survival.” Program presented to the Marion County Forest Landowners Association’s biannual meeting. Jefferson, TX, August 1999.

“Making ‘em All Count.” Program delivered to Trinity County Forest Landowners Association’s quarterly meeting. Trinity, TX, February 1999.
MARK G TJOELKER
Department of Forest Science
Texas A&M University
Office: 979-845-8279
2135 TAMU
Fax: 979-845-6049
College Station, TX 77843-2135
E-mail: m-tjoelker@tamu.edu

(i) Professional Preparation
Calvin College Biology B.S., 1986
University of Tennessee Botany M.S., 1988
University of Minnesota Forestry Ph.D., 1997
University of Minnesota Ecology 1997-2000

(ii) Appointments
Assistant Professor, September 2000—present
Department of Forest Science, Texas A&M University
Post-doctoral Research Associate, July 1997—August 2000
Department of Forest Resources, University of Minnesota
Research Fellow, February 1996—June 1997
Department of Forest Resources, University of Minnesota
J. William Fulbright Scholar, April—December 1995
Polish Academy of Sciences, Institute of Dendrology, Kórnik, Poland
Graduate Research Assistant, September 1991—March 1995
Department of Forest Resources, University of Minnesota
Graduate Research Assistant, September 1989—September 1991
Department of Forestry, University of Wisconsin
Senior Research Assistant, January—August 1989
Environmental Sciences Division, Oak Ridge National Laboratory, Oak Ridge, Tennessee
Graduate Research Assistant, January 1987—December 1988
University of Tennessee and Oak Ridge National Laboratory, Oak Ridge, Tennessee

(iii) Ten Select Publications (total of 51 peer-reviewed journal articles, one book under contract)


(iv) Synergistic Activities


**International Delegate**, National Science Foundation workshop on International Long-Term Ecological Research (ILTER) in Central and Eastern European countries, Warsaw, Poland (September 1998)

**Member**, Ecological Society of America; International Union of Forest Research Organizations; Forestry Honor Society: Xi Sigma Pi

**Educational Activities**, 2000- present, *Forest Ecology* (FRSC 304), *Forest Ecosystems and Global Change* (FRSC 601), Texas A&M University; **Graduate Committees**, 3 Ph.D, 2 M.S. students

(v) Collaborators & Other Affiliations

a) **Collaborators and Co-editors**

Atkin, OK (U York, UK); Bahauddin, D (U Minn.); Bengston, W (U Minn.); Bojarczuk K (Inst. Dendrol., Poland); Bruhn, D (Australian National U, Canberra); Buscenha, C (U
Minn.); Chalupka, W (Inst. Dendrol., Poland); Chorover J (U Arizona); Craine, JM (U Minn.); Davis MA (Macalester, Minn); Eissenstat, DE (Penn. St.); Ellsworth D (U Mich.); Goth, J (U Minn.); Hendry, G (Brookhaven); Hobbie, SE (U Minn.); Jose, S (U Florida); Karolewski, P. (Inst. Dendrol. Poland); Kieliszewska-Rokicka B (Inst. Dendrol. Poland); Knops, JMH (U Neb.); Lee, TD (U Wisc.-Eau Claire); Lorenc-Plucinska, G (Inst. Dendrol. Poland); Machado JL (Swarthmore); Modrzynski, J (Agric. U., Poznan Poland); Nacem, S (U Wash.); Oleksyn, J (U Minn.); Rachwal, L. (Inst. Dendrol., Poland); Reich, PB (U Minn.); Russelle, MP (U Minn.); Tilman, D (U Minn.); Wedin, D (U Neb.); Wrage, K. (U North Dak.); Zytkowski, R (Inst. Dendrol., Poland)

b) Ph.D. and Post-Doctoral Advisor, Peter B Reich, University of Minnesota
c) Thesis advisor, Corey Stover (M.S.), Texas A&M University, Daniel Chmura (Ph.D) Fulbright Scholar (Poland) (2 students total)
W. TODD WATSON  
Assistant Professor of Urban and Community Forestry  
Department of Forest Science  
Texas A & M University System  

Off: 979-458-1753  
Fax: 979-845-6049  
E-mail: t-watson@tamu.edu  
www: http://urbanforestry.tamu.edu

a. PROFESSIONAL PREPARATION  
Ph.D. – Texas A&M University, Plant Pathology, 1999.  

b. CURRENT APPOINTMENT  
- 2001 August – present Assistant Professor (67% teaching and 33% research) and  
  Program Leader for Urban and Community Forestry, Department of Forest Science,  
  Texas A&M University, College Station, TX.

c. CURRENT RESEARCH GRANTS  
  South”. W. T. Watson (Principal Investigator). USDA Forest Service Southern Regions.  
  $100,000 matching.  
  Watson (Principal Investigator). USDA Forest Service Southern Regions. $35,000  
  matching.  
  (Principal Investigator). International Society of Arboriculture. $5,000 matching funds.  
- 2003. “TAMU Horticultural Gardens Tree Initiative/Arboretum”. Don Wilkerson  
  (Principal Investigator). Texas Forest Service. $5,000 matching funds.  
  USDA Forest Service Southern Region (flow thru Texas Forest Service). $50,000  
  matching 2001 (extended through August 2004).

d. PH.D. STUDENTS SUPERVISED  
- Chair: Ph.D. – Dudley Bernard, Department of Forest Science, Texas A&M University,  
  research area: utilizing pervious pavement to preserve trees from urban sprawl.  
- Chair: Ph.D. – Tomas Martinez-Trinidad, Department of Forest Science, Texas A&M  
  University, research area: carbohydrates in declining trees.  
- Committee Member: Ph.D. – Alper Akgul, Department of Forest Science, Texas A&M  
  University, research area: transplanting studies of forest seedlings.  
- Committee Member: Ph.D. – Donita Bryan, Department of Horticultural Sciences, Texas  
  A&M University, research area: transplanting studies of landscape ornamentals.  
- Committee Member: Ph.D. – Hakan Oguiz, Department of Forest Science, Texas A&M  
  University, research area: modeling and predicting future urban growth.
• Committee Member: Ph.D. – Jeff Denny, Department of Horticultural Sciences, Texas A&M University, research area: selection of Taxodium sp. provenances for salt, high pH, and drought tolerance

e. GRADUATE COURSES TAUGHT
  • FRSC 689, Special Topics in Arboriculture, Texas A&M University, Department of Forest Science, Spring 2002.
  • FRSC 689, Special Topics in Urban Forestry, Texas A&M University, Department of Forest Science, Fall 2003.

f. COMMITTEES RELATED TO GRADUATE PROGRAM
  • 2003-present. TAES Urban Research Advisory Committee, Member
  • 2002-present. COALS Scholarship Committee, Member.
  • 2002-present. University Advisors and Counselors, Member.
  • 2002-present. Building Space Committee, Chair.
  • 2002-present. Scholarship Committee, Chair.
  • 2001-present. Graduate Programs Committee, Member.
  • 2001-present. Scholarship Committee, Member.

g. RECENT PUBLICATIONS