

STUDENTS' MANUAL

Master's Degree-Level DISTANCE EDUCATION in WOOD AND PAPER SCIENCE

North Carolina State University
Department of Wood and Paper Science*
Campus Box 8005
Raleigh, NC 27695-8005 (USA)

This manual is intended for students who either have enrolled or are thinking of enrolling in master's-degree level distance courses offered by the Department of Wood and Paper Science at NC State University. It is our goal to help you select, register, and complete semester-based courses that will help you in your career – without requiring you to ever visit the physical campus of the university.

The manual also describes the Master's degree program, to which interested students can apply. Students applying for the degree program are expected to already have a bachelor's degree, plus one or more years of relevant work experience such as employment at a wood products or pulp and paper manufacturing facility or a company that services the pulp and paper industry. If you are considering a degree, you ***must apply and be admitted to the degree program***, either now or at least 8 weeks before you enroll in your third course.

Please read through this manual with care. We welcome you to the program, and it is our commitment to guide you through the process with as much attention as if you were an on-campus student. If you have further questions that cannot be answered by this manual, please contact any of the following people:

Martin Hubbe
Director of Distance Education
(919) 513-3022
hubbe@ncsu.edu

Melissa Rabil
Coordinator of Graduate Program
(919) 515-3181
melissa-rabil@ncsu.edu

Additional information can be found at the following websites:

<http://www.cnr.ncsu.edu/wps> (departmental DE information, use links)

<http://distance.ncsu.edu> (to register for a course, check availability, etc.)

http://distance.ncsu.edu/virtual_orientation (virtual orientation)

<http://www.ncsu.edu/grad/handbook/forms.htm> (forms you may need)

* Note: A new departmental name, "Forest Biomaterials Science and Engineering," was approved by the faculty as of April 2006 and will be phased in at an appropriate time.

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Special Request

If you discover any errors in this manual, including any incorrect or out-dated links to websites, please contact Dr. Martin Hubbe at (919) 513-3022 or hubbe@ncsu.edu.

Caution

As indicated by the cartoon on page 5, it is to your great advantage to make sure that you don't wait too long before applying for admission to the graduate program as a distance student. There are a couple of reasons for this.

1. The **Department** allows you to take only two courses as a "Post-Baccalaureate Student" (PBS) and transfer them into your record once you are enrolled in the Masters degree program. Besides "PBS," The other term used for courses you may take from NC State University before being admitted to the degree program is "Life-Long Learning."
2. The **University** allows you to transfer a total of 12 hours of courses into the degree program. But be careful. Those 12 hours include not only the PBS courses (courses from NC State University that you take *before* you are admitted to the degree program), but also any electives that you might want to transfer from *another* institution.

STEP ONE – What Kind of Student Are You?

At least three different kinds of students use this manual. How you use it ought to depend on which of the following categories best describes you:

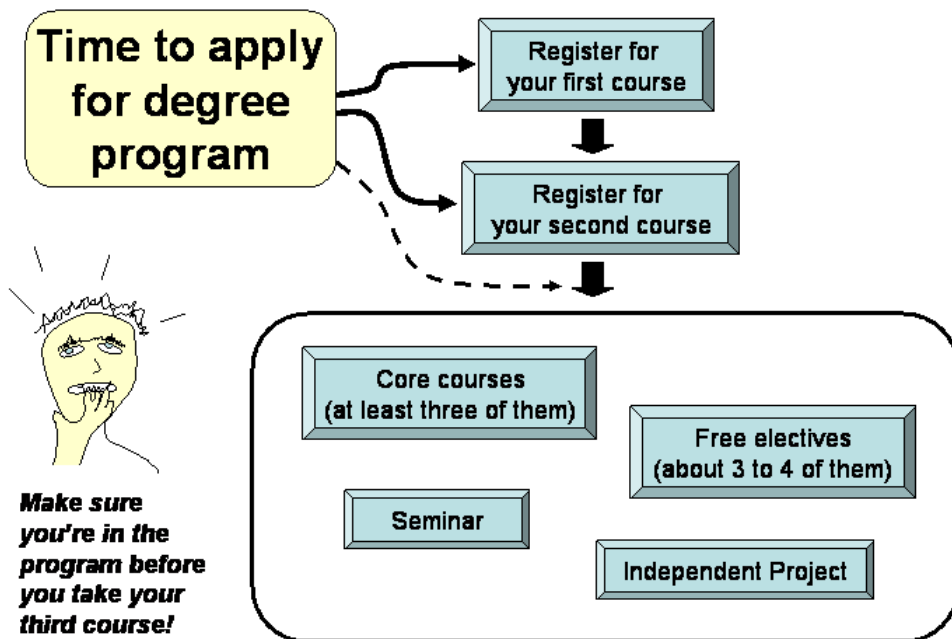
- 1. “I want to learn more about science and technology related to certain aspects of the wood products industry or pulp and paper industry. I will decide later whether I want to earn a Masters degree in this program.”**
 - The first 17 pages of this manual are especially for *you!* Yes, you can pick and choose courses that are likely to especially benefit you in your immediate projects and in your career.
 - Remember, if you later decide to apply for the Masters degree program, then you must complete that process **before** you start your third course. The process of applying to enter the graduate degree program usually takes about 8 weeks, so plan ahead.
- 2. “I want to pursue a Masters degree in order to advance my career. To keep things simple, I’d like to take all of the courses from NC State University.”**
 - With new courses continually being added to our programs (see later), this option is becoming increasingly attractive. After reading the introductory part of this manual, please look more closely at the information related to the Masters degree, starting on page 18. It’s to your advantage to apply and get admitted to the degree program soon, making it possible to transfer some courses later.
 - Work with your Advisor to select appropriate courses.
 - Use the “TRACS” online course registration system to look at the options available at NC State University, both in the Department of Wood and Paper Science, and in other departments, *e.g.* Statistics, Textiles, and Engineering departments. Look for the “Engineering Online” and “Textiles” programs in the “Program List” in Tracks.
- 3. “Because of my situation, it would make excellent sense for me to take some courses that interest me at my local university/community college, etc. And I also want the prestige associated with a Masters degree from NC State University in Wood and Paper Science.”**
 - Yes, our program ought to suit your plans well. Many current and former students have followed the path that you are thinking about.
 - You will need to take an active role in getting the needed information about course offerings – either online or near to your location – and share this information with the Advisor who is assigned to you after you are accepted into the graduate program at NC State University.
 - Work with your Advisor to make sure that the courses you have selected will be accepted by NC State University.

STEP TWO – Courses Available in Program Areas

As you look through the distance courses offered by the department, you will see that they are divided into program areas. While there is no rule against taking courses in both of these areas, most students will want to choose most of their courses either within the **Wood Products** area or the **Paper Science and Engineering** area. A third area of focus deals with **Biomaterials and Bioenergy** applications of lignocellulosic materials and chemicals. Please note that there are certain courses – such as the seminar - that are taken by all students enrolled in the degree program.

STEP THREE – Communication is the Key

Based on at least five successful years of experience, we know that most students adapt well to distance education. Being a relatively small department, we tend to get to know all of our students quite well. As a distance education student, your efforts to get to know us can make a huge difference. Please be ready to communicate frequently with your professors by e-mail, phone, or chat room, depending on the circumstance. Those enrolled in the degree program should check in from time to time with your advisor. As questions arise, especially if you can't find an answer in this document, please feel free to contact the Director or Coordinator of the Department's distance education program. Their contact information is listed on the first page.



View a “virtual orientation” at www.distance.ncsu.edu/virtual_orientation

ABBREVIATED LIST OF DISTANCE-EDUCATION COURSES

The Department offers distance-education courses and degree programs in two areas of concentration: Wood Products, and Paper Science and Engineering. Go to <http://distance.ncsu.edu> well ahead of time and find out when to register.

Fall Semester Courses (Register by mid-August!)*

Wood Products	Paper Science & Engineering
WPS 595U – Wood Products Manuf. & Business (3 cr., <u>core course</u>)	WPS 595R – Paper Characterization (3 cr., can be used as preparation for WPS 565)
WPS 595O – Wood Anatomy and Chemistry (3 cr., <u>core course</u>)	WPS 595M – Chemical Principles for the Papermaking Process Engineer (3 cr., can be used as preparation for WPS 527)
	WPS 565 – Paper Physics (3 cr., <u>core course</u>), even-number years
	WPS 760 - Advanced Pulp and Paper Process Analysis (3 cr., <u>core course</u>), odd yrs
	WPS 577 – Paper Coating and Printing (3 cr., elective), odd-number years
	WPS 595^ - Fundamentals of Biomaterials Science (3 cr., elective)
Both Programs	
WPS 591 – Graduate seminar (1 cr.)	
WPS 625 – Project (0-5 cr. per semester; total = 5)	

Spring Semester Courses (Register by mid-January!)*

Wood Products	Paper Science & Engineering
CE/WPS 528 Structural Design in Wood (3 cr.)	WPS 595Y - Engineering Fundamentals for Pulp & Paper (3 cr., can use to prepare for WPS 760)
WPS 595W - Wood Physics and Mechanics (3 cr., <u>core course</u>)	WPS 595X - Wood, Pulping & Bleaching Chem. (3 cr., can use to prepare for WPS 721)
	WPS 527 – Wet End and Colloidal Chemistry (3 cr., <u>core course</u>)
	WPS 721 - Chemistry of Wood Polysaccharides (3 cr., <u>core course</u>), odd years
	WPS 595G – Pulping and Papermaking Technology (3 cr., elective)
	WPS 595V – Advanced Topics in Paper Recycling (3 cr., elective)
	WPS 595B - Biomaterials Characterization (3 cr.)
Both Programs	
WPS 591 – Graduate seminar (1 cr.)	
WPS 625 – Project (0-5 cr. per semester; total = 5)	

Note (*): For each semester check the following website to find out the time window within which you must register: <http://distance.ncsu.edu>

Admission to the University is not required to enroll in any of the courses, unless pursuing a distance-based Master's degree in Wood and Paper Science. More detailed course information is given later in this manual.

SELECTING AND REGISTERING FOR A COURSE

To select a course, read a description of it, and verify that it is scheduled for the semester about to begin, the first step is to go to the Distance Learning website at:

<http://distance.ncsu.edu>

1. When the page opens, you will be able to follow links (left-hand of screen) to "Apply" (to take a course as a non-registered student), "Registration" (to take a course if you already are in the program), "programs" (note that our department is listed under the College of Natural Resources), "Courses" (which are listed by semester), and "Tuition," etc.
2. To select a course, it is recommended first to select "Courses," then select an upcoming Spring or Fall semester (noting that our department does not have summer courses). Then scroll to "WPS" (Wood and Paper Science).
3. Select "course details" to learn more about a specific course.
4. In addition to considering "within-department" courses, you also can consider taking courses from other departments. Please discuss all of these choices with your academic Advisor (or contact the department's Director of Distance Education). Under "Programs and Courses," you can select "Degree Programs" When the list opens up, you especially ought to take a look at offerings from the "**Engineering Online**" program (<http://distance.ncsu.edu/programs/eol.html>) and "**Textiles**" program (TOPS) at the following URL: <http://www.tx.ncsu.edu/academic/distance/>

We recommend that you first view descriptions of the courses. Check both the "Spring" and "Fall" listings. **Note that many courses are offered just once per year or every other year.** The links at <http://distance.ncsu.edu> are designed to show you just one semester at a time, not all of the available courses. Also, the "Registration" procedure will involve only the current or upcoming semester.

Note that the *Wood Products* courses and *Pulp & Paper* courses are all shown together in the website. You can consult the table on page 6 for a reminder of which courses belong to which academic program in the Department (though the information is not necessarily as up-to-date and complete as the information on

the web). You need to check whether a given course is being offered in the coming semester or in the next listed semester:

Once you have selected a course for the coming semester, and you also have confirmed that you are within the “registration window” time period for registration, go to option “2” of the <http://distance.ncsu.edu> web page. The following is a highlight of information in this section:

- North Carolina residency information
- Non-credit courses, or applying for a degree
- **Registration forms.** The following two forms are required: (1) NC Residency form; (2) Registration form
- Fax numbers for registration
- How to pay
- When to register
- Refund policy

Online registration, for students who already have been accepted into the degree program, is done by clicking on the “Pack Tracks” icon at the upper left of the following webpage: (<http://www.ncsu.edu/registrar/>). If you are already registered as a student, and you have a student ID and password, you definitely will want to do your registration with this online system.

If you don't yet have a student ID and password, the system gives you a way to get those items, so that you will then be able to use the online registration system later. Go to the following page: <http://www.ncsu.edu/acp/application/>, and fill out the online application for “Lifelong Education.” **Caution:** Please be warned that any courses that you take as a “Lifelong Education” (or “Post-Baccalaureate Studies”) student would later need to be **transferred** into a degree program, if you later want to earn the Masters degree, and there is a strict limit of 12 credits **from all sources** imposed by the university.

GETTING AND USING AN NC STATE UNIVERSITY (UNITY) COMPUTER ACCOUNT

Once you have registered for a course, a UNITY ACCOUNT will be set up for you within 48 hours (2 days). Contact the Computing Services HELP DESK at (919) 515-HELP (4357) if you have any problems. E-mail help is available at help@ncsu.edu.

Unity is the distributed computing environment for academic computing at NC State University. Your Unity account gives you e-mail services, plus access to such resources as WebCT® Vista, WebAssign®, and Electronic Reserves, among others.

Before you can access your account, you need to know your Unity login ID and password. The standard convention for automatically generating login IDs is the **first initial** of your **first** and **middle** names and the **first six letters** of your **last name** (family name). Use all lower-case letters; the system is case-sensitive.

Your initial password is your student identification number, all nine digits, with no spaces, e.g. 111223333.

You are encouraged to **change your password early and often**. To keep your account private so that only you have access to it, change your password the first time you log in, and at least once a semester afterwards. DO NOT tell anyone your password. To change your password via the Web, go to <http://www.ncsu.edu/password>.

Your Unity e-mail address starts with your login ID, in the following format: yourloginID@unity.ncsu.edu. Replace the italicized information in this example with your actual login ID.

All new e-mail accounts are using IMAP (Internet Message Access Protocol). With this kind of e-mail, your mail remains on the IMAP mail server, no matter where in the world you read it. For more information about IMAP, see <http://www.ncsu.edu/imap>. Off-campus e-mail users will use your Internet Service Provider's (ISP's) SMTP server for outgoing mail. One way to access your mail is by going to the following website: <http://webmail.ncsu.edu>. Be ready (as usual) to enter your user ID and password.

Forgot your password?

Due to security concerns, the Unity computer group cannot reset passwords through phone or email requests. The official policy is to bring a picture ID to the help desk at the Hillsborough Building (208 Hillsborough ST, Raleigh, NC) and someone there can reset your password back to your Student ID number. Obviously, most off-campus students won't be expected to go to the Hillsborough Building. Please contact your instructor if you find yourself in this Catch-22 situation.

If you have any questions with the registration process, please do not hesitate to contact the following:

Distance Education (DELTA)
Phone (919) 515-9030
Toll-Free: 1-866-467-8283
E-mail: distance_ed@ncsu.edu
(note underscore after "distance")

Credit Programs and Summer Sessions
Phone: (919) 515-2265
Toll-free: 1-866-294-9903
E-mail: acpregristration@ncsu.edu

LIBRARY RESOURCES AND ELECTRONIC RESERVES

During the period of your enrollment in one or more distance-education courses offered by the University, you will have full access to the resources of the library. The Association of Research Libraries ranked NC State University's libraries 27th among 113 member US and Canadian research libraries, as of the year 2003/2004. The NCSU Libraries also was the 2004 recipient of The Gale Group Award for Excellence in Reference and Adult Services awarded by the Reference and User Services Association (RUSA), a division of the American Library Association (ALA). Collections in the D. H. Hill library include a patent depository. Many of the resources of particular interest to wood and paper science are kept in the Natural Resources Library (NRL) in Jordan Hall. The library is committed to providing convenient access to its collections and resources for all members of the university community, **including off-campus students**, regardless of time, location, or course format. The main portal for distance learners to access library resources is as follows: <http://www.lib.ncsu.edu/distance>.

The following library services are of particular interest to distance students:

- ❖ **Electronic reserves:** These are electronic versions of supplementary course materials used in certain courses. You can access them via the web through the following site: <http://www.lib.ncsu.edu/reserves>. Be ready to input either the WPS### designation of the course or the instructor's last name.
- ❖ **Off-campus access to library databases and electronic journals:** The library's website provides a gateway to thousands of full-text electronic journals, databases, and reference sources. Off-campus access to these resources is through <http://www.lib.ncsu.edu/searchcollection/>. Students interested in wood products may be particularly interested in the **TREECD** database. Students interested in pulp and paper may be particularly interested in the **PaperChem** database. Both of these databases can be accessed by following the "browse the subject" instructions provided on the page listed above.
- ❖ **Easy access to electronic journal articles from within databases:** After entering one or more databases as described in the previous bullet, look for links to online articles or use the "Find Text @ NCSU" button in databases to guide you to full text:
http://www.lib.ncsu.edu/instruction/finding_articles/flowchart_distance
- ❖ **Find electronic journals and articles quickly using the E-journal Finder:** The library's E-journal Finder will help you locate electronic versions of journals and articles. <http://www.lib.ncsu.edu/journals>.
- ❖ **Need HELP?** "Ask a librarian" online at the following URL:
<http://www.lib.ncsu.edu/libref/>.
- ❖ **Request books and articles online – free delivery:** If the library has the materials you need, they will ship them to you via FedEx in two business

days, free of charge. If they don't have them in our library, then Interlibrary & Document Delivery Services will search worldwide to find them. You can fill out a form online to request these delivery serves at the following URL:

<http://www.lib.ncsu.edu/distance/delivery.html>

- ❖ **Library questions specific to wood products or pulp & paper science fields:** If you have questions related to specialized resources such as PaperChem (a database of literature citations and abstracts related to pulp and paper technology), TREECD (a database for wood and forestry), statistical sources, and reference books related to this field, we encourage you to communicate with Karen Ciccone or James Jackson Sanborn at the Natural Resources Library: ([Karen Ciccone@ncsu.edu](mailto:Karen_Ciccone@ncsu.edu) or [James Sanborn@ncsu.edu](mailto:James_Sanborn@ncsu.edu)).
- ❖ **Reference service:** Need help using the library or its resources? There are many ways to contact a librarian for assistance:
 - Toll free: (877) 601-0590
 - E-mail: libref@ncsu.edu
 - Live Chat: <http://www.lib.ncsu.edu/libref>
 - Phone: (919) 515-2935
 - FAX: (919) 515-8264, attn: Distance Learning

STUDY HABITS FOR DISTANCE COURSES

As a general rule, distance classes require that students participate actively and keep abreast of the material. There may be quizzes, forums, assignments, and e-mail requirements throughout the semester, not just a mid-term and final exam.

DISTANCE COURSES in DEPARTMENT OF WOOD AND PAPER SCIENCE

In addition to the information shown below, every course has "Course Details," which can be viewed at <http://distance.ncsu.edu>. After the page opens, go to the area at the left of the screen and select "Courses." The courses within the department are listed as "WPS" for Wood and Paper Science.

For convenience, the following information is divided into Wood Science courses, Pulp & Paper courses, and finally, courses of general interest to both groups of students. Note that students in either area of concentration have the option of choosing elective courses outside of their focus area (Wood Science or Pulp & Paper). See information given later about free electives and advised electives.

Registration "windows" of time:

- **FALL registration** usually begins in early August (for new students) and continues until early September (which, however, is already about two weeks into the semester, so you would need to catch up). Continuing

students can register starting near the beginning of June. This is subject to change. For current information go to <http://distance.ncsu.edu>.

- **SPRING registration** usually begins about mid-November and ends about the third week of January (which, however, is already about two weeks into the semester, so you would have to catch up). This is subject to change. For current information go to <http://distance.ncsu.edu>.

Wood Products Courses

WPS 595O Wood Anatomy and Chemistry (3 cr., <u>core course</u>)	The distance section of this course is offered by Dr. Ilona Peszlen, ilona_peszlen@ncsu.edu and Dr. Lucian Lucia, lucian_lucia@ncsu.edu .
WPS 595U Special Topics: Wood Products Manufacturing and Business (3 cr., <u>core course</u>)	In this course, we will explore the value chain of wood products - from log to product disposal after its use. The course will cover generic and specific manufacturing and business systems, concepts and tools. The first half will focus on wood products manufacturing, the second on wood products business and industries. These two subjects are interrelated and are therefore covered simultaneously to some degree. Staff. No. prerequisite. Graduate level.
WPS 595W - Wood Physics and Mechanics (3 cr., <u>core course</u>)	Physical properties of wood, including moisture interaction, dimensional behavior, specific gravity, psychrometry, stress and set, and thermal properties; Mechanical properties of wood and wood composites, strength theories, fracture mechanics and fatigue of wood. Dr. Perry Peralta, perry_peralta@ncsu.edu .
CE/WPS 528 Structural Design in Wood: (3 cr.)	This is a web-based course, featuring streaming audio and resource materials that open from the website. The subject matters are: design of solid sawn and laminated beams, columns, beam-columns, shear walls, diaphragms and connections. Staff, <i>Graduate level</i> .
WPS 625 Advanced Wood and Paper Problems (var.)	Selected problems in the field of wood and paper science. Instructor to be selected. The number of credit hours per semester is variable between zero and five. Five credit hours of this course are required for graduation.

Paper Science and Engineering Courses

Note: Students who apply for and enroll in the Master's degree program are required to complete three of the four courses marked as Core courses.

<p>WPS 595G Pulping & Papermaking Technology (3 cr.)</p>	<p>Comprehensive study of pulping and papermaking technology. Discussions focus on how one part of the paper mill affects another, and how the raw materials and processes affect product quality. Participants prepare a paper related to evolutionary and revolutionary changes in technology. Dr. Michael Kocurek, mike_kocurek@ncsu.edu</p>
<p>WPS 595R - Paper Characterization (3 cr.)</p>	<p>This course focuses on the basics of paper testing with a brief introduction to paper physics. The course is for entry level graduate students with little or no knowledge of the paper industry. The course contains the following topics: introduction to paper grades, overview of papermaking, an introduction to paper structures, testing theory, statistics, paper tests (optical, mechanical, and barrier), use and application of paper testing data. Dr. Joel Pawlak, joel_pawlak@ncsu.edu</p>
<p>WPS 595M - Chemical Principles for the Papermaking Process Engineer (3 cr.), annual</p>	<p>An introduction to chemical principles, as applied to papermaking, wastewater treatment, coating, and recycling operations. Students apply concepts of chemical equilibria, interactions of polyelectrolytes, adsorption, flocculation, and chemical reactions of interest to papermakers. Examples are considered related to the sizing of paper, strength additives, and retention aids. This course can be used as an introduction to WPS 527. It is recommended that students with a strong background in chemistry skip directly to WPS 527 instead of this course. Dr. Martin Hubbe, hubbe@ncsu.edu. Graduate level.</p>
<p>WPS 595Y - Engineering Fundamentals for Pulp and Paper</p>	<p>This course can be taken alone or as a preparation for the core course WPS 760. The course features applications related to pulping and papermaking. Dr. Hasan Jameel, h_jameel@ncsu.edu.</p>
<p>WPS 595X - Wood, Pulping, and Bleaching Chemistry</p>	<p>This course can be taken alone or as a preparation for the core course WPS 721, for those students who need it. Dr. Dimitris Argyropoulos, dimitris.argyropoulos@ncsu.edu</p>

WPS 527 - Core Wet End and Colloidal Chemistry (3 cr.)	<p>The course objective is to prepare students to solve problems related to chemical usage on paper machines. Subjects include paper machine operations, fibers, fillers, chemistry of additives, colloids, control of paper's interactions with liquids, strength, dyes, strategies to optimize retention, dewatering strategies, strategies to achieve more uniform paper, strategies to improve production rates, and wet-end chemical process control. Dr. Martin Hubbe, hubbe@ncsu.edu</p>
WPS 565 - Core Paper Physics (3 cr.)	<p>This course is intended for the advanced student. It begins with basic paper physics and a brief discussion of paper testing. The course then addresses some of the predominant theories in paper physics and derives them from first principles. A relatively strong background in statistics and calculus is a plus, as well as a solid knowledge of papermaking processes. Topics include fibers and bonds, network geometry, sheet structure, formation, structure on optical properties, in-plane properties of paper, Page's equation, structural mechanics of paperboard, dimensional stability, rheology and moisture effects, transport phenomena, absorbency, and swelling. Dr. Joel Pawlak, joel_pawlak@ncsu.edu</p>
WPS 721 - Core Chemistry of Wood Polysaccharides (3 cr.)	<p>Fundamental organic and physical chemistry of wood components with emphasis that relates to their industrial processing and analysis. Included topics are structural enquiries of carbohydrates and lignins, process chemistry of polysaccharides and lignins, traditional and modern spectroscopic methods of analysis etc. In addition, the course covers recent advances made in the field and strives to correlate these new discoveries to their technological and environmental ramifications. Dr. Dimitris Argyropoulos, dimitris.argyropoulos@ncsu.edu. <i>Prerequisites: CH 223 and WPS 332 or BCH 451. Graduate level.</i></p>
WPS 760 - Core Advanced Pulp and Paper Process Analysis (3 cr.)	<p>Design and analysis of pulp and paper mill processes; process control applications in pulping, chemical recovery, bleaching and papermaking; principles of pulp mill chemical and energy recovery; and new alkaline pulping recovery technology. Dr. Orlando Rojas, Orlando_rojas@ncsu.edu. <i>Prerequisites: College level chemistry, physics, and mathematics. Graduate level.</i></p>
WPS 577 Paper Coating and Printing (3 cr.), odd-number years	<p>Major printing processes and grades of coated paper are presented. Coating base sheet requirements and design of coating formulation are related to end use requirements. Coating additives and rheology are analyzed in terms of coating process requirements. The effect of application and drying systems on transport phenomena of coating into paper will be analyzed. Dr. John Heitmann, heitmann@ncsu.edu</p>
WPS 595B Principles & Applications of Biomaterials Science (3 cr.)	<p>Brief introduction to structural, synthetic, and functionality aspects of biomaterials, followed by discussion of fundamental forces that govern their molecular organization. The formation of higher order structures will be described, e.g. self-assembly. Characterization techniques and structure-property relationships will be covered. Course offered by Lucian A. Lucia, Orlando J. Rojas, and Dimitris S. Argyropoulos; contact Lucian.lucia@ncsu.edu; (919) 515-7707</p>
WPS 595O Advanced Paper Science (3 cr.)	<p>This is a Special Topics course in Wood and Paper Science focusing on Advanced Paper Science. Permission required. <i>No prerequisites. Graduate level.</i> Dr. Hasan Jameel, h_jameel@ncsu.edu</p>
WPS 595V Advanced Topics in Paper Recycling (3 cr.)	<p>This course, scheduled for each spring semester, is presented by Dr. Richard Venditti, richard_venditti@ncsu.edu</p>

Courses of Interest to Both Areas of Concentration

<p>WPS 510 Strategic Business Processes for the Forest Products Industry (3 cr.)</p>	<p>Strategic Business Processes is designed to introduce the technically trained student to organizational, management, and leadership processes that drive a successful business. The course highlights the differences between principled leadership and “opinion poll” leadership, the need to balance the conflicting wants of major stakeholders in the business, the importance of a unique strategy, the linkage between strategy and day-to-day implementation of the strategy and the ingredients and requirements for a successful career. Real time illustrations are based on the forest products industry. Mr. David Ashcraft, david_ashcraft@ncsu.edu. <i>No prerequisites. Graduate level.</i></p>
<p>WPS 595F Special Topics in Excellence in Manufacturing (3 cr.)</p>	<p>Graduate seminar focusing on examination and improvement of profitability of wood products manufacturing facilities. Drs. Joe Denig, joe_denig@ncsu.edu, and Phil Mitchell, phil_mitchell@ncsu.edu. <i>No prerequisites. Graduate level.</i></p>
<p>COURSES OFFERED BOTH FALL AND SPRING</p>	
<p>WPS 591 Master’s Seminar (1 cr.)</p>	<p>Master’s Seminar provides practice in making a technical presentation. This course is mainly of interest to students in the degree program. Dr. Richard Venditti, Richard_venditti@ncsu.edu</p>
<p>WPS 620 Wood and Paper Science Problems (3 cr.)</p>	<p>Assigned or selected problems in the field of wood, paper, and pulp science and technology. Instructor to be assigned. <i>Prerequisite: Senior or graduate standing. Graduate level.</i></p>
<p>WPS 625 (variable 1-5 cr.)</p>	<p>Project course (see more details in the later section dealing with the Masters degree program).</p>
<p>WPS 690 Master’s Examination (3 cr.)</p>	<p>For students in non-thesis masters programs who have completed all other requirements of the degree except preparing for and taking the final master’s exam. <i>Prerequisite: Master’s student. Graduate level.</i></p>

USING INSTRUCTIONAL RESOURCES

Most instructional resources, such as course websites, phone numbers, *etc.*, will be made clear to you after you sign up for a given course. This section describes some general procedures for dealing with such things as Online Quizzes (WebAssign®) and Electronic Reserves.

Course Website Information

Not all courses offered in the university's distance education program have websites, but many of them do. If in doubt, contact the instructor or the Director of Distance Education. Though there is a wide variety among course websites, you will find that an increasing number of them can be accessed through the following URL: <http://vista.ncsu.edu>. Be ready to select any courses that you have enrolled in according to its letter-number designation, *e.g.* "WPS595M." Also be ready to enter your user ID and password. Courses within the WebCT VISTA environment are "wrapped" so that only students get to see the content. The VISTA system also has secure grade reporting and online quizzing, *etc.*

Some courses have websites outside of the WebCT VISTA system. For instance, some courses use the computing environment called "Wolfware." You can access such courses from the site <http://courses.ncsu.edu>.

Certain other courses have websites that are always viewable by the public, at least in part, without password protection. Here is the link for such a website, showing the papermaking wet-end and colloidal chemistry site: <http://legacy.ncsu.edu/classes/wps595b002/>

Electronic Reserves (Web Delivery of Supporting Documents for Courses)

Click on the following link to reach NCSU's Electronic Reserves system:

<http://www.lib.ncsu.edu/reserves/>

Use the following procedure to get connected and gain access to the online copies of articles:

1. Enter your professor's name (Option a) or the course number (Option b).
 - Example: Hubbe
 - Example: WPS527(Note, in particular that there are no spaces between the letters and numbers of the course designation.)

2. The next screen will give you an opportunity to either click on the professor's name or click on the course number, depending on what you decided to do step 1.

The next step is to select an article that you would like to see, and double-click on it. The system should respond by asking you to enter your Unity user name, and your password (see earlier discussion). The system assumes that you have Adobe Acrobat® Reader or an equivalent version already loaded onto your computer. This program can be downloaded for free at <http://www.adobe.com/products/acrobat/readstep2.html>.

For questions related to the e-reserve system you can call (919) 515-2597 or send an e-mail to reserves@ncsu.edu. To talk to a librarian about reference issues, during office hours, call 919-515-2935 or send an e-mail at the following page: <http://www.lib.ncsu.edu/risd/libref/form.html>

OnLine Quizzes (WebAssign®)

Assuming that you already have obtained a Unity ID and password, and if the course you are taking involves the WebAssign® online quiz system, you should be able to use the following steps to take your quizzes as they become available to you:

1. Go to <http://webassign.ncsu.edu>
2. Click "login"
3. Click "Continue login" at the NC State University page
4. Enter your unity UserID
5. Enter your unity password
6. Click "login"
7. You should see your assignment summary page.

If you are told you are not authenticated, then you may have mistyped your *UserID* or *password*. If you are told that you were successfully authenticated but not sent back to WebAssign, then go to <http://webassign.ncsu.edu> again and you should be granted access without going through authentication again. Proceed with your homework. If you are told you are not affiliated with any department, restart your computer and browser and try again. If this happens repeatedly, contact your professor. If neither of the approaches suggested above work, check your Unity *UserID* and *password* (see earlier). You may want to check that you have not depressed the "Caps Lock" key, since passwords are case-sensitive.

MASTER'S DEGREE IN WOOD AND PAPER SCIENCE

The distance learning Master's degree is available to individuals professionally employed and who have a minimum of one year of relevant industry experience. A Bachelor's degree from a relevant program is also required. The program is designed to meet both personal career objectives and industry needs.

Go to the following website to get basic information about the Distance Masters program in Wood and Paper Science:

<http://cnr.ncsu.edu/wps>

For additional information, you can contact any of the following people:

- Dr. Martin A. Hubbe, Dir. Distance Ed., (919) 513-3022, hubbe@ncsu.edu
- Ms. Melissa Rabil, Student Services Assistant, (919) 515-3181, melissa_rabil@ncsu.edu
- Dr. Richard A. Venditti, Dir. Graduate Program, (919) 515-6185, richard_venditti@ncsu.edu

Registering for the Degree Program

There is a departmental requirement that you as a student must **apply and be accepted** by the Graduate School for the Masters of Wood and Paper Science program before enrolling in your **third** course in the program. Please plan ahead, since the application process usually takes 2 to 4 months.

In addition to the Departmental rules, the University has set a limit of no more than 12 transfer credits **from any source** that can be counted towards your NC State University Masters degree. That **includes** NC State courses that you might take before applying and being accepted into the degree program. If in doubt, it is usually to your advantage to apply and get admitted to the program right away, so that you won't have to worry about this issue.

Though each application is considered individually, there are some general guidelines governing admission to the distance-learning Masters program (designated "WPZ"). Applicants are expected to have completed a four-year bachelor's degree program and an accredited college or university. Applicants are expected to supply grade transcript information. If a Graduate Record Exam (GRE) has been taken, that information can be supplied; however the GRE is **not required** in the case of distance-education applicants. Recommendation letters are requested in the application. Finally, other than by actually applying, there is no way to know for sure that you will or will not be admitted.

Students can apply to the graduate school online at the following website:

<http://www.ncsu.edu/grad/>

More information can be found at the Departmental website pertaining to the master's degree program. Please use the following link.

<http://www.cnr.ncsu.edu/wps>

Transfer of Credits

Yes it *is* possible to transfer credits from qualified courses you have taken or will take at other institutions, including distance education. However, the following rules apply:

1. Transfers are considered by the university only when the student completes a "Plan of Work," which can happen only after they are enrolled in the graduate program.
2. A maximum of 12 transfer hours are allowed by the University. This total includes not only any courses taken at other institutions, but also any courses taken from NC State University prior to admission to the program.
3. Only graduate-level courses for which one has received an A or B will be accepted. The acceptability of courses also is to be reviewed by the department's director of the graduate program, as well as by the university's graduate office. The director of the graduate program will write a letter, to accompany the plan of work, recommending the transfer credits.
4. One does not earn any "quality" points for transfer credits.

Assignment of an Advisor

Upon admission to the graduate program, each student is assigned a faculty advisor. It is highly recommended that students review the interest areas of various faculty members in the Department of Wood and Paper Science, using the departmental website link shown above. Though such recommendations will be regarded seriously, the Department will have the final say.

Requirements for Graduation

The distance learning based Masters of Wood and Paper Science degree is intended to meet the career development and corporate needs of individuals professionally employed, and who have relevant experience. Our preferred program requirement is for these non-traditional students to fulfill their requirements with 30 credit hours. However, a total of 36 hours will be required of prospective degree candidates lacking the relevant experience. Currently, at

least one year of industry experience is the minimum guideline. Candidates not meeting experience criteria may be required to complete an additional 6 hours of instruction to satisfy the degree requirements.

Wood Products concentration: Degree requirements are as follows for those who wish to pursue a concentration in the **Wood Products** area:

The Masters of Wood and Paper Science degree (WPZ) with a concentration in Wood Products will require completion of the following three core courses, plus various other electives, seminar, and a project:

COURSES	CREDIT HOURS
Required Core Courses*	
WPS 595U Wood Products Manufacturing & Business	3
WPS 595W Wood Physics and Mechanics	3
WPS 595# Wood Anatomy & Chem.	3
Electives	
Advised Electives	12
Free Electives	3
Independent Project	5
Seminar	1
TOTAL	30
* - These requirements are currently under review	

Paper Science and Engineering concentration: The following list of requirements for the Masters of Wood and Paper Science degree with a **Pulp and Paper** concentration assumes that the one-year experience requirement has been met:

- 30 credit hours
- Completion of at least three out of the four “core courses” shown in the following table (at least 9 credit hours, if not 12)
- Those who choose to take just three of the core courses will be required to take a designated preparatory course (sometimes informally called a “slash” course, due to the university’s numbering system), in order to achieve a total of 12 credit hours covering each of the four core areas of study in the department. Your Advisor can guide you in selecting such a course from the second table following this point.
- Completion of 9 credit hours in courses that are approved by your advisor as advised electives (which may include introductory-level offerings)
- Completion of an independent project (at least 5 credit hours, see later)
- One seminar credit (see later)

COURSES	CREDIT HOURS
Required Core Courses*	
WPS 565, Paper Physics	3
WPS 527, Wet End & Colloidal Chem.	3
WPS 720, Wood Chemistry	3
WPS 760, Process Analysis	3
Electives	
Advised Electives	9
Free Electives	3
Independent Project	5
Seminar	1
TOTAL	30

* As has been noted, it possible for a student to substitute for one of the core courses shown above with a preparatory-level course. The philosophy behind these courses is that they are built upon content from our high-quality undergraduate curriculum, but in order to receive graduate-level credit, it is required for the student to do something extra, such as complete an assigned term paper. The following table shows which of the preparatory courses (left-hand column) would then be used to fulfill the requirements of **one** of the four core courses (right-hand column). Students interested in this option should check with their Advisor. Note that the preparatory courses listed below also can be taken as electives, with permission of your advisor.

Introductory Course	Core Course
Paper Characterization (WPS 595R)	Paper Physics (WPS 565)
Chemical Principles for the Papermaking Process Engineer (WPS 595M)	Wet End & Colloidal Chemistry (WPS 527)
(Wood, Pulping, & Bleaching Chemistry (WPS 595X)	Chemistry of Wood Polysaccharides (WPS 721)
Engineering Fundamentals for Pulp and Paper (WPS595Y)	Process Analysis (WPS 760)

Unique Features of the Degree

- You get to work on an industry-relevant project that can provide solutions to your employer's problems.
- You can take engineering courses, science courses, statistics course, *etc.*, that are available by distance from other departments of the university.
- You have the opportunity to interact with and utilize the expertise of world-renowned faculty.

General Guidelines for Course Selection

A typical load of distance courses is either one or two per semester. In planning how you will complete the degree requirements, given above, it is worth considering the following guidelines:

1. It is recommended **not** to put off any **core courses** (see earlier) beyond the second year in which you are involved with the program. You need to complete any core courses in order to graduate. These courses are usually offered on alternate years. Communicate with your advisor and consult the Tracks online registration system to find out what is currently being offered.
2. Start thinking early about what you might want to do as a **Wood and Paper Science Problem** (WPS 625). You will need to select and be accepted by one of the faculty members in the department to advise you in completing this project.
3. You should maintain correspondence with your Advisor in the department to ensure you are on track to finish the degree requirements on schedule and are taking advantage of all of the resources available to you
4. Remember to hunt diligently through the different lists of available courses each upcoming semester. First go to <http://distance.ncsu.edu> and select the upcoming semester, and select "WPS" or other departments of possible interest for elective courses. The section numbers for distance education courses, if shown, always have numbers of "601" or higher. Also search through such sites as Engineering Online (<http://EngineeringOnline.ncsu.edu>) and the Textiles online program (<http://www.tx.ncsu.edu/academic/distance>).

Sample Academic Plans

The following are two hypothetical examples of academic plans. (These plans are for purposes of illustration only, since some level of turnover of available courses can be expected.)

EXAMPLE #1 Environmental Emphasis

Course	Credits
WPS 565 Paper Physics	3
WPS 527 Wet End & Colloid Chemistry	3
WPS 721 Chemistry of Wood Polysaccharides	3
WPS 760 Advanced Pulp and Paper Process Analysis	3
CE 576 Air Pollution Control	3
CE 773 Hazardous Waste Management and Treatment	3
Advised elective	3
Advised elective	3

WPS 625	Independent Project: Volatile Organics (VOCs) Control in a Kraft Pulp Mill	5
WPS 591	Seminar	1
TOTAL Credit Hours		30

EXAMPLE #2 Product Development Emphasis

Course		Credits
WPS 565	Paper Physics	3
WPS 527	Wet-End & Colloidal Chemistry	3
WPS 721	Chemistry of Wood Polysaccharides	3
WPS 760	Advanced Pulp and Paper Process Analysis	3
TC 762	Physical Chemistry of High Polymers	3
CHE 565	Diffusion of Polymers	3
ST 502	Experimental Statistics	3
MAT 705	Mechanical Properties of Materials	3
WPS 625	Independent Project Design of a New Liquid Packaging System	5
WPS 591	Seminar	1
TOTAL Credit Hours		30

Recommended Distance Learning Graduate Electives

You will select electives with the approval of your Advisor. Specific electives for any one semester/year will be based upon (1) academic plan, (2) availability, and (3) prerequisites. It is expected that the list of distance learning based courses will change from year to year. A summary list is provided below (but you need to check availability when you go through the online registration process):

Course	Credit Hours
CHE 565 Diffusion of Polymers	3
CHE 713 Thermodynamics 1	3
CHE 715 Transport Phenomena	3
CE 572 Design of Water and Waste Water Facilities	3
CE 574 Chemical Principles of Environmental Engineering	3
CE 576 Air Pollution Control	3
CE 588 Water Resource Engineering	3
CE 773 Hazardous Waste Management and Treatment	3
IE 546 Management Decision Control Systems	3
IE 589M Lean Production and Manufacturing	3
IE 723 Prod Planning, Schedule, Control	3
MA 501 Adv. Math for Engineers and Scientists 1	3
MAE 533 Finite Element Analysis	3
MAE 524 Principles of Mechatronic Control	3
MAT 705 Mechanical Properties of Materials	3
OR 501 Introduction to Operational Research	3

ST 502 Experimental Statistics	3
ST 503 Statistics for Management	3
ST 515 Experimental Statistics for Engineers	3
ST 702 Advanced Statistics	3
TC 530 The Chemistry of Textile Auxiliaries	3
TC 565 Polymer Applications and Technology	3
TC 762 Physical Chemistry of High Polymers	3
TT 500, 503, 504, 505, and 506 (Textiles Technology courses)	3
WPS 625 Advanced WPS Problems	3

Planning and Completing the WPS 625 Independent Project

The learning objectives of the WPS 625 project are as follows:

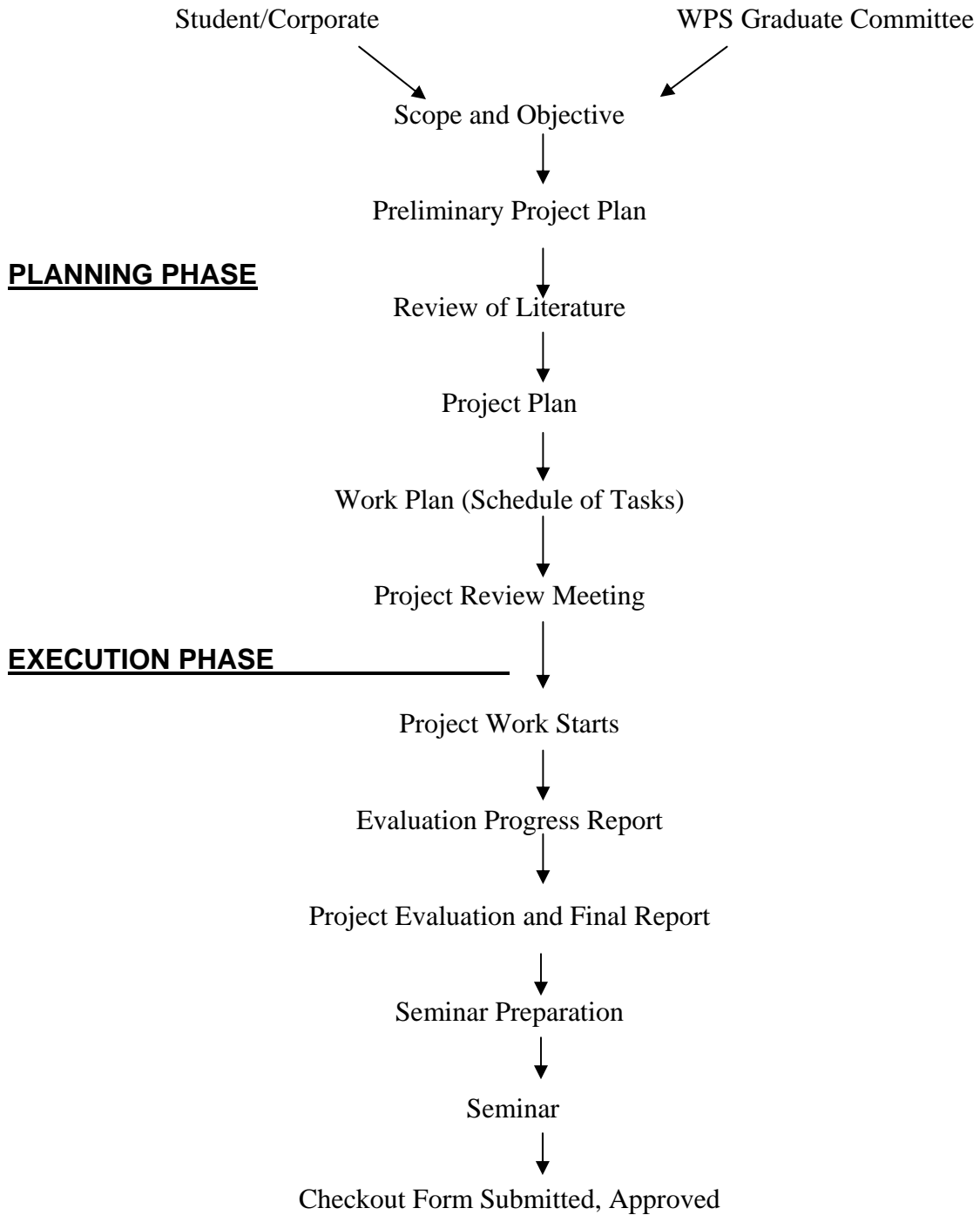
1. To learn the analysis, design, and planning of a scientific technical project
2. To manage a project with emphasis on scientific fundamentals
3. To prepare and deliver a distance learning based seminar

The following diagram shows some of the steps that you can anticipate in carrying out the WPS 625 research project. Each “node” shown in the plan diagram indicates an occasion when you are expected to have an interaction with the faculty member who is supervising the WPS 620 project. Variations in the order of steps in the plan are welcomed – for instance scheduling of the seminar presentation before other steps – and these need to be discussed with the Advisor.

Phase of Project	Step No.	Task
Design phase	1	Student and Graduate Advisor meet (usually by phone).
	2	General scope and objectives are selected
	3	Corporate buy-in to idea is obtained, as appropriate
	4	A preliminary project plan is written down. (It is not specified who writes the project plan, but both the student and the Advisor need to approve of it.)
Planning phase	5	Review the literature.
	6	Project plan (with an approximate timetable)
	7	Meeting with Advisor to review the plan, and approve it if it meets the general criteria for scientific content, scope, and reasonable degree of challenge.
Execution	8	Project work starts.
	9	Meet with Advisor to evaluate progress (usually according to a pre-arranged frequency of meetings).
	10	Progress report (or partial draft of Final Report)
Presentation	11	Final Report submitted (see format instructions)
	12	Final Report reviewed by Advisor and any deficiencies noted
	13	Final Report accepted by Advisor
	14	Oral presentation (often combined with Seminar requirement)
	15	Final exam (which usually is a phone call with the Advisor and other faculty they might choose to test the students knowledge in their area of concentration)
	16	Complete and submit "Request for Option B Graduation Checkout" form

OUTLINE, WPS 625 Project

ANALYSIS AND DESIGN PHASE



Format for WPS625 Project Final Report

To complete your WSP625 independent project, students are expected to write a scientific paper.

Centuries of developing tradition have defined the format of a scientific paper, such as you would expect to find in a peer-reviewed journal. This document specifies the format that you will use.

Though your goal, in writing your final report, will be to achieve “publication quality,” it is important to emphasize that, unlike traditional thesis documents, WPS625 final reports are not distributed beyond the faculty members involved in the evaluation. Your advisor may ask one or more faculty members to serve as an acting committee to help make sure that your report meets the requirements.

The nature and scope of the research project are decided between the student and their Advisor. Each project needs to take into consideration the physical resources available to the students, including the types of research experiments that might or might not be possible. Also, it is desirable to select a topic that is likely to provide useful information for the student’s employer. Further information about the WPS625 project is given in the “Students’ Manual” for the Master’s Degree-Level Distance Education in Wood and Paper Science. A copy (which includes this section) can be downloaded from <http://cnr.ncsu.edu/wps>.

Your own paper will be expected to conform to the standards described below:

I. Main Sections

- A. Title
- B. Abstract
- C. Introduction
- D. Materials and Methods
- E. Results and Discussion
- F. Conclusions
- G. References

A. Title

- The title should be the fewest possible words that accurately describe the content of the paper.
- Under the title you should put your name and the place where you performed your research. Please also state that the work was completed in the fulfillment of requirements of the Masters degree requirements in the Department of Wood and Paper Science at North Carolina State University.

B. Abstract

- An abstract identifies the basic content of the paper quickly and accurately.
- It should be no more than 250 words.
- It should concisely state the purpose of the scientific work, the hypothesis, a brief description of the procedure, and the results.
- The idea of the abstract is to let a reader know whether or not they want to take the time to read your whole paper.
- The abstract should be written last, after everything else is done.

C. Introduction

- The introduction states your purpose along with background information that led you to this study. It should state what information led you to your stated hypothesis, which addresses the answer to the project's problem question that you were assigned. Basically this is a small report on your topic.
- The Introduction should introduce the scientific research already performed (be it experiment or observations) and list any pertinent facts the reader should know.
- Appropriate literature should be cited throughout the text, including the Introduction, Materials and Methods, and Results and Discussion sections. You may use either of two systems for noting references in the text. Option One: "Various workers have studied this issue [Jones, 1998; Smith and Yao, 2003; van de Vries *et al.*, 1983], *etc.*" Option two: "Various workers have studied this issue [4-6], *etc.*" In the case of Option One, all of the citations must be in alphabetical order in the References section. In the case of Option Two, all of the citations need to be numbered in order of their appearance in the text, and that is the same order in which they should be listed at the end of your report.
- Include any relative scientific theories or facts that pertain to the scientific research. The background included in this section should help identify concepts or equations used in the Results and Discussion portion of the paper. This helps get the reader up to speed on what science is involved and also lets them know where you are going with the paper.
- Include your hypothesis in the introduction and *why* you believe this to be your hypothesis. Your background information should help to justify your hypothesis.

D. Materials and Methods

- The purpose of the materials and methods section is to provide enough detail for somebody else to repeat your study and reproduce the results. Basically, how did you do your experiment or research?
- The materials section should list what you used (besides computers and humans) to conduct the experiment. Example: balance, ruler, stopwatch, Geiger counter, *etc.*

- The methods section should describe step-by-step how the experiment was performed.
- In the case of projects that do not include experimental work (e.g. theoretical projects or detailed literature reviews, as agreed with your Advisor, this section is not needed).

E. Results and Discussion

- In the results section you present your findings. Present the data, typically in the form of tables and graphs, and describe any useful information you found.
- All tables should have a caption underneath it starting with Table 1:, Table 2:, *etc.* followed by a brief description.
- All graphs should have a caption underneath it starting with Figure 1:, Figure 2:, *etc.* followed by a brief description.
- Identify mathematical relationships – increasing, decreasing, or constant relationships between variables. Identify the independent and dependent variable. Make sure to use and discuss statistical tests to show whether or not your findings are significant at a suitable level of confidence.
- Discuss any conclusions you can draw from the data. In addition, compare and contrast your experiment to any other similar experiments that have been performed by other scientists.
- Finally, write about any interesting facts, surprises, mishaps, or unexpected observations you made during the experiment. List any problems you had during the experiment. Not only should a reader get a sense of what the mathematical results are, they should also get a sense of what went on during the experiment.

F. Conclusion

- End the paper with a short summary regarding the significance of your work. Don't leave the reader thinking "So what?".
- State whether or not your hypothesis was confirmed and give evidence supporting your statement.
- Re-state any important findings and conclusions from your research or experiment.
- Is there anything you could have done better in your experiment? Tell the reader what might have been a better approach to your experiment.
- Finally, tell the reader what future projects or experiments can be done. The idea is that you cannot do everything, but other scientists may be able to perform some of the experiments you do not have time for.

G. References

- All sources of information used to create the paper should be listed as shown in the citation guidelines at the end of this document.
- Although no credit will be deducted for inclusion of citations indicating Internet sources or conference reports, a high priority must be placed on providing a high-quality review of previous work published in peer-review

scientific journals. Patents and high-quality books are also highly regarded as primary sources of information.

- In the case of “Option One” (see Introduction), all citations should be listed alphabetically.
- In the case of “Option Two” (see Introduction), all citations should be in order of their appearance, in the form “1. Jones, *etc.*”.

II. LENGTH

- Minimum 5000 words, assuming that the work meets all of the expectations. Based on the font and spacing specifications (see below), this translates to about 16 pages of text, not counting figures and tables.
- Maximum: None, unless specified by Advisor.

III. PAPER FORMAT

- 12 font Arial or Times New Roman;
- Title and Sections should be **bold** and should be left justified.
- No clipart or wordart – and no artwork or “pretty” backgrounds should be used on your graphs. This should be a professional representation of your work.
- Reports must be typed using 1 ½ spacing.
- All tables and graphs should have labels (Figure 1, Table 1) and captions.
- Place an extra space between sections and citations in the Reference section.

IV. SCIENTIFIC WRITING STYLE

All papers must be written using scientific writing. This includes using passive voice without using personal pronouns such as I, he, she, we, and you. Look at the scientific writing examples below:

Bad Example: I poured the koolaid and I mixed it up.

Good Example: 100 mL of distilled water and 0.5 g of cherry koolaid were mixed in a 200 mL beaker.

Bad Example: We measured the pH of the fish tank.

Good Example: The pH of the fish tank was determined using pH paper.

Though many people (including Microsoft software) criticize use of the passive voice as being dull and indirect, scientists have many reasons to favor use of the passive voice. In particular, the style emphasizes objectivity. The style tends to discourage boastfulness. The style emphasizes what was done, rather than the eloquence of the writer.

Finally, no personal or “feelings” comments should be included. For example, do not say things like: “We really learned a lot from this project” or “I liked doing the experiment”.

LITERATURE CITATIONS (REMEMBER TO LIST THESE ALPHABETICALLY)

BOOK

Ayers, E. L., *Fairy Tales in Our Time and Why we Should Read Them*, Oxford University Press, Oxford, 1995.

ARTICLE FROM MAGAZINE OR JOURNAL

Kronen, L., "Bog Mummies," *Discover Mag.* 33 (1): 36-38 (1997).

WEB SITE

Stoddard, M., “Dragons,” Feb. 1995;
<http://amber.medlib.arizona.edu/homepage.html>. [Accessed 16 Sept 1997].

CD-ROM

Walker, Alice (Malsenior) 1944-, *Contemporary Authors on CD*. CD-ROM. Detroit: Gale Research Inc., 1994.

INTERVIEW

Alexie, Sherman. Telephone interview. 20 August, 1998.

If the information comes from **YOU**:

Himburg, Eric. Internal Review. 14 November 2001.

FILM

[please note: films begin with the film title; alphabetize by the first word (not *the*, or *a*) format: Title. Director. Lead Actors. Producer, year released.]
Much Ado about Nothing. Dir. Kenneth Branagh. With Emma Thompson, Kenneth Branagh, Denzel Washington. Goldwyn, 1993.

EMAIL

Page, Mel. [pagem@etsuarts.east-tenn-st.edu] "Cinderedna and Cinderella."
Private e-mail message to Elise Emler on 28 November 1996.

COMPLETION OF OPTION B FORM

The following page provides a copy of the “Request for Option B Graduation Checkout” form, which must be completed by your Advisor, after you have successfully completed your WPS 625 project to his or her satisfaction.

**THIS FORM MUST BE IN THE GRADUATE SCHOOL
NO LATER THAN 30 DAYS AFTER FIRST DAY OF SEMESTER
IN WHICH STUDENT INTENDS TO GRADUATE**

REQUEST FOR OPTION B GRADUATION CHECKOUT

To: Robert Sowell, Dean

Date: _____

From: _____
(Director of Graduate Programs/Major Advisor) -- type or print legibly

1. Request graduation checkout for the following student (type or print legibly):

(Name & Student ID Number of Student)

(Degree Objective)(Major)

2. The advisor(s) is(are) _____

_____ Name(s) of Advisor(s)

3. This student should graduate in the _____ Spring
_____ Summer (check one) semester, _____
_____ Fall (year)

4. I verify that (check one):

_____ the faculty member(s) named above is(are) the student's advisor(s).

_____ the name(s) of this student's advisor(s) and the student's Plan of Graduate Work have been submitted and approved by my department/program on GARS.

(Signature of Director of Graduate Programs)

Approved: _____
Robert Sowell, Dean

Date: _____

FORM REVISED: 2/04

**DATA FORM FOR “PLAN OF GRADUATE WORK”
for distance education students in Dept. of Wood & Paper Science**

This form is intended to help advisors of Distance Education students in completing “plan of work” (POW) documents, which are part of the advising process. Every student should aim to have a “plan of work” in place within about six months of admission to the program. (Note: The form is **not** needed if you just plan to take one or more distance education courses without intending to later pursue the degree through the Department of Wood and Paper Science.)

Date: _____
 Family Name: _____
 Given Name and Middle Name: _____
 Student Identification Number: _____
 Degree Sought: Masters of Wood and Paper Science
 Estimated Date of Completing the Degree (month, year): _____
 School: College of Natural Resources
 Major: Wood and Paper Science
 Subject of WPS625 Project: _____
 Advisor (professor): _____

Below, please make a list of the courses that you intend to take in completion of your degree (subject to later change, with your advisor’s approval). Add as many lines as you need, after the example. (Please do not assign grades to yourself in the case of courses that you will be taking in the future!):

Course #, Title	Credit Hours	Term	Grade
<u>WPS ###B Example Course</u>	<u>3.00</u>	<u>Fall 20##</u>	<u>A-</u>
_____	_____	_____	_____
_____	_____	_____	_____
<i>etc.</i>			

Please follow the guidelines given in this document so that your selected courses meet the requirements for your area of concentration (Wood Products or Paper Science and Engineering). When you are done, please e-mail or otherwise send the file to your academic advisor, with a copy to the director of the distance education program (hubbe@ncsu.edu; FAX=919-515-6302; direct line = 919-513-3022)