

Wood Science and Technology Program Accreditation in the United States- History, Guidelines, Processes and Changing Demand

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Abstract

The Society of Wood Science and Technology (SWST) began accrediting university based, undergraduate level Wood Science and Technology programs in 1984. The accredited programs have been quite successful in producing qualified professionals who are skilled in the fundamentals of wood science and technology. Until recently only University programs in the United States were considered for accreditation although the Society is now expanding the opportunity for accreditation to international programs.

The demand for traditionally trained wood science and technology professionals is diminishing in the United States. Conversely, in the wood products industry, the demand for professionals trained in the broader aspects of materials science, industrial ecology, markets and marketing, biomaterials, bioenergy, regulatory policies, “green” building materials and business management skills is increasing. While SWST accreditation standards will continue to require a fundamental understanding of wood as a material, efforts are underway to broaden the guidelines to meet the needs of the modern marketplace.

Keywords: University Accreditation, United States Wood Science and Technology, Accreditation, educational programs, education.

Introduction

The Society of Wood Science and Technology has had an active professional accreditation program for 26 years and currently accredits programs at a number of major universities in the United States. This paper will discuss the current status of professional accreditation in the United States, discuss, briefly, the history and purpose of accreditation, the status of wood science education, and emerging changes to accreditation in the United States.

Background

In the United States, educational accreditation is a type of quality assurance under which services and operations of post-secondary (University level) educational institutions or programs are evaluated by an external body or agency to determine if applicable standards are met. If the standards are met, accredited status is granted.

There are two major types of accreditation in the United States. The first is the accreditation of the University as an educational institution or University-wide accreditation. University-wide accreditation in the United States is based on peer review. It began before WWII, but the initiative was weak. The United States government began to play a limited role in accreditation in 1952 with reauthorization of the GI Bill for Korean War veterans. Specifically, there was a need to develop standards for quality and admission and the Bill or law provided government money for military veterans to complete their college educations. The original GI Bill (WWII) stimulated the establishment of new colleges and universities to accommodate war veterans, but some of these new institutions were low quality. To insure educational quality, the GI bill designated a peer review process as the basis for accreditation. Government funding for students was eventually limited to those enrolled at accredited institutions included on a list of federally recognized accredited institutions published by the U.S. Commissioner of Education (CHEA 1998).

In most countries in the world, the function of educational accreditation is conducted by a government organization, such as a ministry of education. In the United States the quality assurance process is independent of government and performed by private membership in associations that existed long before university accreditation became an issue. The associations are regional, not national, and they work together with the federal government to develop accreditation guidelines for Universities who are members of the associations. The six University accrediting organizations in the United States are as follows:

- **Middle States Association of Colleges and Schools (MSACS)**
Established: 1919, Location: Pennsylvania, Web: www.msche.org
- **New England Association of Schools and Colleges (NEASC)**
Established: 1885, Location: Massachusetts, Web: www.neasc.org

- **North Central Association of Colleges and Schools (NCACS)**
Established: 1895, Location: Illinois, Web: www.ncahlc.org
- **Northwest Commission on Colleges and Universities (NWCCU)**
Established: 1917, Location: Washington, Web: www.nwccu.org
- **Southern Association of Colleges and Schools (SACS)**
Established: 1912, Location: Georgia, Web: www.sacscoc.org
- **Western Association of Schools and Colleges (WASC)**
Established: 1962, Location: California, Web: www.wascenior.org

A map showing the states covered by the University accrediting bodies is shown as Figure 1.

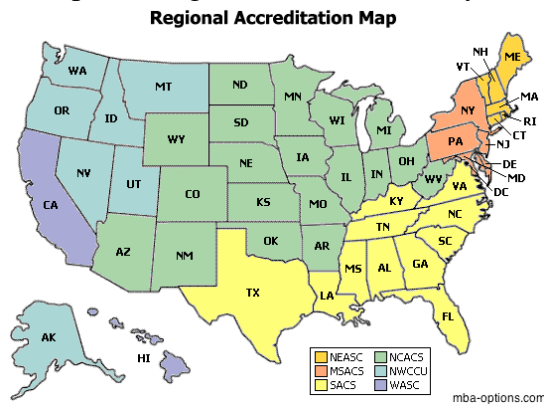


Figure 1. Territories covered by accrediting associations in the United States.

The second type of accreditation in the United States relates to specific programs and disciplines (eg: mechanical engineering, wood science etc.) or schools (Art or Sculpture Institute etc.). University wide accreditation is very broad and it does not insure programmatic quality. As in the case of University wide accreditation, programmatic accreditation is done by non-governmental bodies. Those bodies are often national or international associations that develop guidelines for accreditation that insure students are exposed to a certain level of discipline-specific knowledge and to guard against unacceptable practices. The US federal government formally “recognizes” some accrediting bodies who petition for recognition and who meet certain federal guidelines.

In general, discipline related accreditation is rigorous. The guidelines tend to be quite specific regarding what topics from the discipline are to be taught and, in some cases; the specific level of competence is specified. The preparation by the program being accredited is detailed and comprehensive. After preparation, an accrediting team, usually comprised of peers in the discipline, performs a detailed on-site review followed by a lengthy report listing positives and negatives of the program along with a list of recommendations. The entire process, which is expensive, often takes over a year to complete.

Reasons for Becoming Accredited¹

There are a number of reasons why Universities and specific programs have sought accreditation. The first and most important reason is to insure quality in education. Second, without accreditation, access to federal funds for student loans and federally funded grants for research is limited.

A third reason has to do with the transfer of credits. In the United States, students often transfer from one university to another and, without some level of quality being established by accreditation, transfer of credits from one university to another is impossible. The issue of transferability becomes more and more important as distance education becomes more common. It is now frequent that a student takes courses through on-line resources at several universities and transfers the credits to another institution. The institution accepting the credits must feel that the level of quality is acceptable and accreditation provides a mechanism for acceptance. A fourth reason for institutional accreditation has to do with generating the confidence of employers. Institutions that provide accredited programs, in many cases, will enjoy a higher level of confidence of employers and the products they produce than will other institutions. This is not typically a problem with the natural resource professions, but it certainly is a concern in some of the more technical training areas where students are expected to have a certain baseline knowledge in order to be able to immediately go to work providing technical services.

The basic reasons for accreditation—quality assurance, recognition, and credibility are clear. In some instances, accreditation may also leverage additional university support. That is, in order to gain or maintain accredited status, the institution must provide some level of program support. Accredited status then enables the argument for support to be generated and maintained. Most, but not all, universities find value in having their programs accredited, especially if the incremental costs are not too great. With some professions, such as engineering, accreditation is absolutely mandatory for students and graduates to have access to employers, licensing or certification systems that will enable to go out and work in the profession. That's not currently the case in wood science and technology. However, because accreditation standards, in essence, define a profession, accreditation provides a certain measure of accountability to those standards. Seeking accreditation, achieving accreditation and maintaining it, does support and influence the profession over a period of time. Certainly, it can be argued that it promotes competency among the graduates of those programs.

SWST Accreditation

SWST began its accreditation activities in 1978 with a formal program established in 1984. The program was in partnership with the Society of American Foresters (SAF) and, to some extent, remains that way. The Society currently identifies three specific objectives in evaluating a program (SWST A 2010):

¹ Much of the following section is taken from a presentation prepared by Dr. Thomas McLain for the Society of Wood Science and Technology in 2002.

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- to improve the quality of professional education in wood science and technology through the mechanism of self-assessment and external review
- to recognize U.S. institutions that meet or exceed minimum requirements set by SWST;
- to promote and encourage the adoption of those elements of professional training deemed essential for practicing wood scientists and wood technologists.

Following the basic approach used by the Society of American Foresters and others, six broad areas of emphasis or “Standards” are defined for accreditation. In abbreviated form, they are as follows:

1. Standard I—Program Mission, Goals and Objectives
2. Standard II—Curriculum and Student Competencies
3. Standard III—Organization and Administration of the Teaching Program
4. Standard IV—Faculty
5. Standard V—Students
6. Standard VI- Parent Institution Support

For many years, Standard II has been defined in great detail by SWST. For example:
Standard II—Curriculum and Student Competencies including:

- A. Preparatory and General Education courses
- B. Training in Basic Wood Sciences
 - a) Anatomy and Biology of Wood Formation; Wood Identification
 - b) Physical Properties
 - c) Mechanical Properties
 - d) Chemical Characteristics and Properties
 - e) Wood Degradation and Deterioration
 - f) Composite Materials
- C. Wood Processing and Manufacturing
 - a) Mechanical Reduction and attrition
 - b) Drying Processes
 - c) Manufacture of Solid Wood Products
 - d) Chemical Wood Processing
 - e) Wood Protection and Enhancement

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D. Contemporary Issues of Wood Use:

- a) Understanding the demand and use of wood-based products as well as the impact on society and the environment.
- b) Understanding the principal applications of wood and wood-based materials by choosing and specifying appropriate wood-based products for a variety of uses.
- c) Understanding the major policy, regulation, environmental and other societal issues that impact the discipline.
- d) Understanding professional ethics, including the SWST Code of Conduct, and recognition of ethical responsibility to adhere to those standards.
- e) Understanding the health, safety, and security issues that impact manufacturing and use of wood-based products.

E. Professional Area of Emphasis

Students must demonstrate competence in an area of professional emphasis that compliments their wood science and technology education.

Until recently specific topics were identified as above and the number of credit hours required under each topic were recommended. For example, one SWST Accreditation approach was that 21 semester hours be taught in Wood Science and Technology, a minimum of 6 hours must be in the area of Wood Properties and 6 hours in Wood Processing and Manufacturing. Other topics were also carefully defined.

Following national guidelines from the US Department of education, SWST changed its guidelines in 2005 to what is termed outcomes-based assessment for programs. Using “outcomes based” assessment; the approach is for the program being accredited to show “demonstrated competencies” in specific areas. At present, the programs are required to show demonstrated competencies in the areas shown above rather than to complete a specific number of credit hours. In the United States the actual accreditation of a Wood Science and Technology program consists of three major steps: a self-study using prescribed standards and criteria; a review by an external team of peers that is captured in an assessment report; and, the review and recommendation for action by the accrediting body. Accreditation is voluntary and ten Universities in the United States are currently accredited. In 2009, SWST accredited the University of Bio-Bio in Chile and is considering expansion to China and elsewhere. A complete list is shown in the Table below.

Program Reviewed	Initial Accreditation	Most Recent Accreditation	Current Accreditation Expires
Mississippi State Univ. Mississippi State	1987	2007	2017
North Carolina State Univ., Raleigh	1984	2005	2015
Oregon State Univ., Corvallis	1990	2001	2011
Pennsylvania State Univ., University Park	1992	2003	2013
State Univ. of New York, (SUNY) Syracuse	2002	2003	2013
Universidad del Bio-Bio, Concepcion, Chile	2009	2009	2019
University of Idaho, Moscow	1996	2005	2015
University of Maine, Orono	1993	2003	2013
University of Minnesota, St. Paul	1985	2007	2017
Virginia Polytechnic Institute and State Univ., Blacksburg	1985	2005	2015
West Virginia Univ., Morgantown	1989	2009	2019

Table 1. Programs accredited by SWST as of August, 2010. (SWST B, 2010)


Problems and Solutions

Interest in Wood Science and Technology as a specific discipline is waning in the United States. The number of students registered in accredited programs has never been robust and has diminished over time when compared to other programs. Most Wood Science and Technology programs in the United States have been the subject of scrutiny from University administrations and some have been eliminated due to the lack of enrolled students. The pattern is familiar in the United States and has affected other programs in agriculture and disciplines such as metallurgy.

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Wood science and technology research in the United States has been strong for years and has resulted in major changes in the processing of forest resources as well as substantial new product development and refinement. Federally funded research, a strong point for academics in Wood Science programs, has shifted to other areas in recent years. The shift in funding has affected the ability of Wood Science faculty to attract high quality graduate students and that has removed one of the strengths of the programs in the United States. On the other hand, the demand for graduates remains strong and most graduates have successful careers in the forest products industry. Faculty in Wood Science programs are adjusting rapidly as challenges mount.

The challenges cited have resulted in a number of programs in the United States revamping their curricula. Major curricular changes have already occurred at the University of Minnesota, North Carolina State University, Oregon State University and the University of Idaho. Plans for change are underway at the University of Maine and elsewhere. In broad terms, the changes seem to be following the path shown in the Table below;

Program	Traditional Emphasis	New Emphasis
	Wood Science and Technology Program	Basic biology/chemistry of wood and wood fibers
		Basic biology/chemistry of renewable materials
		Wood and wood structure mechanics
		Green building materials
		Sporadic emphasis in most cases
		Environmental and ecological concerns related to renewable materials
Renewable or Sustainable Materials Program	Wood and wood fiber processing	Renewable materials processing and environmental effects.
	Wood and fiber drying, physical properties	Physical properties of renewable materials, bioenergy, bioenergy systems
	Forest products marketing and management	Business, entrepreneurship and management in renewable materials companies.

The essential thrust of the changes taking place across the US is to broaden and rebrand the programs to include “biomaterials”, “bioproducts”, “green materials”, biosystems engineering and to address environmental and ecological issues. The emphasis has also shifted to a more directed understanding of business issues and entrepreneurship. The accreditation standards will follow soon.

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