

Learning Goals for Undergraduate Forestry and Natural Resources Majors
Undergraduate Student Learning Initiative
University of California – Berkeley

The Forestry and Natural Resources (FNR) major at the University of California at Berkeley is designed to prepare students to manage forests and wildlands while sustaining ecological integrity and producing vital ecosystem services. The program combines a foundation in the relevant natural and social sciences with explicit hands-on learning opportunities. Students completing this major will be prepared to engage in the challenge of managing forest and natural resources in a rapidly-changing world.

The FNR major includes a professional option (Forestry and Natural Sciences, Professional Forestry specialization) that is accredited by the Society of American Foresters. The Forestry and Natural Resources major also includes a Natural Sciences specialization in the Forestry and Natural Sciences concentration and a Human Dimensions of Natural Resources concentration. The Professional Forestry specialization provides four years of qualifying education or professional experience for licensing as a professional forester in California. The goals of the Professional Forestry specialization are very closely associated with the educational requirements of the forestry profession and prepare our students for careers in forestry or closely related natural resource fields.

When students graduate with a FNR major from UC Berkeley, they will have the basic knowledge and skills to assess and manage forest resources. Graduates with the Professional Forestry specialization should have basic competencies as defined by the Society of American Foresters' requirements of accredited degree programs. Graduates with the Natural Sciences or Human Dimensions in Natural Resources concentrations will have similar competencies. Knowledge and skills for FNR majors are based on the four major subject areas required by the Society of American Foresters. These four subject areas and the basic competencies expected of students areas follows.

A. Ecology and Biology:

Competencies must be documented as an:

1. Understanding of taxonomy and ability to identify forest species, their distribution, and associated habitat requirements.
2. Understanding of soil properties and processes, hydrology, water quality, and watershed functions.
3. Understanding of ecological concepts and principles including the structure and function of ecosystems, plant and animal communities, competition, diversity, population dynamics, succession, disturbance, and nutrient cycling.
4. Ability to make ecosystem, forest, and stand assessments.
5. Understanding of plant and animal physiology and the effects of climate, fire, pollutants, moisture, nutrients, genetics, insects and diseases on ecosystem health and productivity.

B. Measurement of Forest and Natural Resources:

Competencies must be documented as an:

1. Ability to identify and measure land areas and conduct spatial analysis.

2. Ability to design and implement comprehensive inventories that meet specific objectives using appropriate sampling methods and units of measurement.
3. Ability to analyze inventory data and project ecosystem conditions.

C. Management of Forest and Natural Resources:

Competencies must be documented as an:

1. Ability to develop and apply silvicultural and restoration prescriptions appropriate to management objectives, including methods of establishing and influencing the composition, growth, and quality of forests and wildlands, and understand the impacts of those prescriptions.
2. Ability to analyze the economic, environmental, and social consequences of resource management strategies and decisions.
3. Ability to develop management plans with specific multiple objectives and constraints.
4. Understanding of the valuation procedures, market forces, processing systems, transportation and harvesting activities that translate human demands for timber-based and other consumable natural resource products into the availability of those products.
5. Understanding of the valuation procedures, market, and non-market forces that avail humans the opportunities to enjoy non-consumptive products and services of forests and wildlands
6. Understanding of the administration, ownership, and organization of forest and resource management enterprises.

D. Resource Policy, Economics, and Administration:

Competencies must be documented as an

1. Understanding of resource policy and the processes by which it is developed.
2. Understanding of how federal, state, and local laws and regulations govern the practice of forestry and resource management.
3. Understanding of professional ethics and recognition of the responsibility to adhere to ethical standards in decision making on behalf of clients and the public.
4. Ability to understand the integration of technical, financial, human resources, and legal aspects of public and private enterprises.

Table of competencies and curriculum requirements. Electives are directed toward course lists on website and departmental advising guides.

Subject Matter Competency Category	FNR Professional Forestry specialization	FNR Natural Sciences specialization	FNR Human Dimensions concentration
A. Ecology and Biology 1) Taxonomy 2) Soils and hydrology 3) Ecological concepts 4) Assessments 5) Forest health and productivity	ESPM 101a, 108a ESPM 101a, Electives ¹ ESPM 101a, 102a ESPM 101b, 101c, 102a ESPM 101a, 134, Elective ¹	ESPM 101a, Electives ² ESPM 101a, Electives ¹ ESPM 101a, 102a ESPM 101b, 101c, 102a ESPM 101a, Electives ¹	ESPM 101a ESPM 101a, Electives ¹ ESPM 101a, 102a ESPM 101b, 101c, 102a ESPM 101a, Electives ¹
B. Measurements 1) land areas and spatial analyses 2) inventories 3) Data analysis and projection	ESPM 101c, 72, Electives ³ ESPM 101c, 102b ESPM 101c, 101e, 102b, 183, Electives ³	ESPM 101c, 72, Electives ³ ESPM 101c, 102b ESPM 101c, 101e, 102b, Electives ³	ESPM 101c, 72, Electives ³ ESPM 101c, 102b ESPM 101c, 101e, 102b, Electives ³
C. Management 1) Silviculture 2) Forest decisions 3) Management plans 4) Harvest systems 5) Non-timber resources 6) Administration	ESPM 101b, 185 ESPM 102c, 183 ESPM 102c, 183 ESPM 101d, 182 ESPM 183, 185 ESPM 102d, 182	ESPM 101b, Electives ⁴ ESPM 102c, Electives ⁴ ESPM 102c, Electives ⁴ ESPM 101d, Electives ⁴ Electives ⁴ ESPM 102d, Electives ⁴	ESPM 101b, Electives ⁴ ESPM 102c, Electives ⁴ ESPM 102c, Electives ⁴ ESPM 101d, Electives ⁴ Electives ⁴ ESPM 102d, Electives ⁴
D. Policy, Economics, and Administration 1) Forest policy 2) Regulations 3) Professional ethics 4) Integration of resources	ESPM 102d ESPM 102d, 182 ESPM 102d, 182 ESPM 183	ESPM 102d, Electives ⁴ ESPM 102d, Electives ⁴ ESPM 102d, Electives ⁴ Electives ⁴	ESPM 102d, Electives ⁴ ESPM 102d, Electives ⁴ ESPM 102d, Electives ⁴ Electives ⁴

¹ May be met by required elective from Physical Environment course list

² May be met by required elective from Ecology course list

³ May be met by required elective from Monitoring & Measurement course list

⁴ May be met by required elective from Management & Policy course list

Communicating Learning Goals to FRN Undergraduates

A webpage is available for the Forest and Natural Resources major that provides key information to students and potential students: <http://espm.berkeley.edu/ugmajors/FNR/index.php>

The same web site also has information on the goals of the major and career options, student planning options including areas of concentration, and faculty advisors. Students in the major will be aware of these goals through the surveys on skills and knowledge. The Department of ESPM regularly updates handbooks on all its majors, including Forestry and Natural Resources. These handbooks are available online at: http://espm.berkeley.edu/ugmajors/FNR/FNR_Handbook.pdf

Assessment of Majors

Grades, job placement, graduate school acceptances, and performance on the California licensing examination for foresters are primary means of assessment. At time of degree completion we will administer a survey based on Society of American Foresters' competencies of all students in the major. The survey will also ask students to evaluate quality of instruction, advising, resources for instruction/fieldtrips, and access to professional opportunities such as contact with professionals and job information/placement.

What is Needed to Implement these Goals

The science and management of forests and natural resources are critical contemporary environmental issues and the programs at UC Berkeley have been leaders in these fields for nearly 100 years. To continue this leadership and provide excellence in our undergraduate experience, Forestry and Natural Resources requires:

- 1) Student services personnel sufficient in numbers to meet with students and assist them in advising and curricular choices.
- 2) Sufficient funding to provide the essential field experiences that are necessary to this major.
- 3) Modern field instructional equipment to prepare students for employment opportunities in the public and private sectors.
- 4) Assistance with job placement for students.
- 5) Increased involvement of faculty in the primary goals of the FNR major through advising and teaching classes.