The unique association the college has with the University of Tennessee and the other units of the Institute of Agriculture makes it possible for the college to offer comprehensive, high-quality graduate programs.

The graduate student is expected to demonstrate a thorough knowledge of the subject matter in his/her specialized field of study and its relationship to the sociological, economic, and environmental impact on society. The student must demonstrate the ability to plan, conduct, analyze, and report original research. Emphasis is given to intellectual growth and the development of scholarly habits of study, reasoning and analysis so that the graduate will continue to grow and develop professionally throughout his/her career.

**Master of Science Programs**

Programs of graduate study leading to the Master of Science degree are offered through all departments in the College of Agricultural Sciences and Natural Resources. The graduate program may be entirely in one major subject or may include subject matter areas related to the major.

Both majors and minors are available in agricultural economics, agricultural and extension education, animal science, biosystems engineering, biosystems engineering technology, entomology and plant pathology, environmental and soil sciences, food science and technology, and plant sciences. Majors only are available in forestry and wildlife and fisheries science, and minors are available in general agriculture. The minor in general agriculture requires 12 hours of coursework. A complete listing of majors is shown on the Graduate Degrees, Majors, and Certificate Programs Chart.
Doctoral Programs

Graduate study leading to the Doctor of Philosophy degree with majors in animal science, biosystems engineering, food science and technology, natural resources, and plants, soils, and insects is offered in the college.

AGRICULTURAL AND EXTENSION EDUCATION PROGRAM

http://aee.tennessee.edu

Randol G. Waters, Graduate Liaison

Professors

Waters, R.G. PhD .................................................................Penn State

Emeriti Faculty

Lessly, R.R., EdD .............................................................Oklahoma State

Todd, J.D., EdD .................................................................Illinois (Champaign)

MAJOR DEGREE

Agricultural and Extension Education .....................................................MS

The Agricultural and Extension Education program offers a Master of Science degree with a major in agricultural and extension education. The program is designed primarily for teachers of Agricultural Education and staff employed by UT Extension. However, due to the flexibility of the program, it would be of value to any student interested in agriculture or adult and continuing education. The program may be completed under a thesis or non-thesis option with a concentration in either agricultural education or agricultural extension education. Candidates for the master’s degree must meet the general requirements of the Graduate Council and those stipulated by the department.

MAJOR OF SCIENCE

Agricultural and Extension Education Major

REQUIREMENTS

Thesis Option

A candidate for the master’s degree who elects the thesis option must successfully complete

- a minimum of 30 hours of graduate credit in courses approved by the student’s advisory committee
- a minimum of 20 hours of graduate credit in courses numbered at or above the 500 level
- a minimum of 12 hours of graduate credit in courses appropriate to the area of concentration taught in the department and a minimum of 6 hours taught from outside the department
- a minimum of three hours of graduate credit in coursework in either research methodology or statistics
- a final oral examination

Non-Thesis Option

A candidate for the master’s degree who elects the non-thesis option must successfully complete

- a minimum of 36 hours of graduate credit in courses approved by the student’s advisory committee
- a minimum of 24 hours of graduate credit in courses numbered at or above the 500 level
- a minimum of 12 hours of graduate credit in courses appropriate to the area of concentration taught in the department and a minimum of 6 hours taught from outside the department
- a minimum of 3 hours of graduate credit in coursework in either research methodology or statistics
- a creative component designed by the student and approved by the student’s advisory committee for 3 hours of graduate credit
- a written and oral comprehensive examination

Department of

AGRICULTURAL ECONOMICS

http://economics.ag.utk.edu

Dan L. McLemore, Head

John R. Brooker, Graduate Liaison

Professors

Brooker, J.R., PhD .................................................................Florida

Cross, T.L. (Assistant Dean), PhD .....................................................Oregon State

Eastwood, D.B., PhD .................................................................Tufts

English, B.C., PhD .................................................................Iowa State

Garland, C.D., PhD .................................................................Tennessee

Hall, C.R., PhD .................................................................Mississippi State

Jensen, K.L., PhD .................................................................Oklahoma State

Klindt, T.H. (Interim Dean), PhD ..................................................Kentucky

McLemore, D.L., PhD .................................................................Clemson

Mundy, S.D., PhD .................................................................Tennessee

Orr, R.H., PhD .................................................................Illinois

Park, W.M., PhD .................................................................Virginia Tech

Rawls, E.L., PhD .................................................................Virginia Tech

Ray, D.E., PhD .................................................................Iowa State

Riley, J.B., PhD .................................................................Oklahoma State

Roberts, R.K., PhD .................................................................Iowa State

Smith, G.F., PhD .................................................................Tennessee

Associate Professors

De La Torre Ugarte, D.G., PhD .............................................................Oklahoma State

Lin, J.A., PhD .................................................................Oklahoma State

Yen, S.T., PhD .................................................................Minnesota

Assistant Professors

Bazemore, E.F., PhD .................................................................Kentucky

Cho, S.H., PhD .................................................................Oregon State

Clark, C.D., PhD .................................................................Vanderbilt

Tiller, K.H., PhD .................................................................Tennessee

Emeriti Faculty

Leuthold, F.O., PhD .................................................................Wisconsin

MAJOR DEGREE

Agricultural Economics .................................................................Master of Science
MASTER OF SCIENCE
Agricultural Economics Major

REQUIREMENTS

The Department of Agricultural Economics offers a program of graduate study leading to the Master of Science. The MS program may be completed under a thesis option with a concentration in agricultural economics. A non-thesis option is available with concentrations in agricultural economics or agribusiness. For specific information, contact the department head.

Agribusiness Concentration

The MS agribusiness concentration is designed to prepare students to succeed in the public or private sectors of agriculture, including product manufacturing and marketing, natural resource management, farm management, and financial analysis. A candidate must complete a minimum of 31 hours of graduate credit in courses approved by the student’s master’s committee. At least 28 hours must be earned in courses numbered at or above the 500 level. Sixteen hours of agricultural economics, 3 hours of economic theory, 6 hours of quantitative methods, 6 hours of business, statistics, or communications electives, and 6 hours of internship are required. Each student must pass both written and oral comprehensive examinations.

Agricultural Economics Concentration • Thesis Option

The MS thesis option in agricultural economics is designed to prepare students for analytical and research careers in the public and private sectors, and to prepare students interested in entering a PhD program. A candidate must complete a minimum of 31 hours of graduate credit in courses approved by the student’s master’s committee. At least 28 hours must be earned in courses numbered at or above the 500 level. In the thesis option, 16 hours of agricultural economics, 6 hours of economic theory, 6 hours of quantitative methods, and 6 hours of thesis are required. Each student must pass a final oral examination.

Agricultural Economics Concentration • Non-Thesis Option

The MS non-thesis option in agricultural economics is designed to prepare students for analytical and research careers in the public and private sectors. A candidate must complete a minimum of 36 hours of graduate credit in courses approved by the student’s master’s committee. At least 33 hours must be earned in courses numbered at or above the 500 level. In this non-thesis option, 30 hours of agricultural economics courses and 6 hours of directed electives are required. Each student must pass both written and oral comprehensive examinations.

Agricultural Economics Minor

A minor will include six hours of coursework in the department, with at least three hours in 500-level courses. The student’s committee must include a member of the faculty from the department who will be responsible for designating courses required for the minor.

Environmental Policy Minor

The department participates in a program designed to give graduate students an opportunity to develop an interdisciplinary specialization in environmental policy. See Department of Economics for program description.

DOCTOR OF PHILOSOPHY
Natural Resources Major

Students interested in pursuing doctoral studies in the area of natural resource economics and policy may do so under the PhD major in natural resources located administratively within the Department of Forestry, Wildlife and Fisheries (see Department of Forestry, Wildlife and Fisheries catalog entry for detailed information). The student’s doctoral committee will assist the student in developing a program of graduate course work that will meet the requirements for the PhD with a major in natural resources while drawing heavily from the Department of Agricultural Economics and the Department of Economics.

Department of ANIMAL SCIENCE

Alan G Mathew, Head
K.R. Robbins, Graduate Liaison

Professors
Conatser, G.E., MS .........................................................Kentucky
Gill, W.W., PhD ..........................................................Kentucky
Godkin, J.D., PhD ..................................................Massachusetts
Hopkins, F.M., DVM ..................................................Tennessee
Kattesh, H.G., PhD ...............................................Virginia Tech
Kirkpatrick, F.D., PhD ........................................Tennessee
Lane, C.D., PhD ........................................................Tennessee
Matthew, A.G., PhD .................................................Purdue
Meadows, D.G., PhD ..............................................Texas A&M
Neel, J.B., PhD ........................................................Tennessee
Oliver, S.P., PhD .........................................................Ohio State
Robbins, K.R., PhD ................................................Illinois
Rogers, G.W., PhD ........................................North Carolina State
Saxton, A., PhD .........................................................North Carolina State
Smith, M.O. PhD .....................................................Oklahoma State

Associate Professors
Grizzle, J.M., PhD ......................................................Florida
Harper, F., PhD .........................................................Rutgers
Heitmann, R.N., PhD ........................................Maine
Schrick, F.N., PhD ..................................................Clemson
Waller, J.C., PhD ......................................................Nebraska

Assistant Professors
Edwards, J.L., PhD ................................................Florida
Kojima, C.J., PhD ................................................Missouri
Lin, J., PhD ........................................................Ohio State
Pighetti, G.P., PhD ...............................................Penn State
Richards, C.J., PhD .................................................Kentucky

Instructor
Fisher, A.E., MS ........................................................Tennessee

MAJOR DEGREES

Animal Science ........................................................MS, PhD
The Department of Animal Science offers graduate programs leading to the Master of Science and Doctor of Philosophy with a major in animal science. At the Master of Science level, areas of concentration are animal genetics, animal health and well-being, animal management, animal nutrition, and animal physiology with orientation towards beef cattle, dairy cattle, swine, and poultry. The Doctor of Philosophy program offers areas of emphasis in animal genetics, animal health and well-being, animal nutrition, and animal physiology. For specific information, contact the department head.

All first- and second-year Master of Science students are required to enroll in 596 each spring term and all first- and second-year Doctor of Philosophy students are required to enroll in 696 each spring term.

MASTER OF SCIENCE
Animal Science Major

ADMISSION

For admission to the Master of Science program, a student must have obtained a 3.0 grade point average on a 4.0 scale (or a 3.0 each term during the junior and senior years) in a completed undergraduate degree program in one of the animal sciences or in a related area. The student must submit evidence (letters of recommendation, personal interview, etc.) that indicates ability to complete requirements for the Master of Science. Prerequisite courses may be required if the student has insufficient undergraduate background. If the student has an unsatisfactory grade point average, acceptance may be on a probationary (non-degree) basis and a minimum of nine hours of graduate coursework must be completed the first term with a minimum grade point average of 3.0 for admission to the Master of Science program.

REQUIREMENTS

The program requires the writing of a thesis based on original research; the completion of a minimum of 24 hours of graduate coursework, of which at least 14 hours must be taken in courses numbered at or above the 500 level; and six hours of thesis. Included in the course requirement are one hour of Agriculture 512 and a minimum of three hours in statistics courses approved for the ICGSP. The remainder of the coursework will be selected jointly by the student and the major professor depending on the student’s area of concentration and professional objectives.

The advisory committee will consist of the major professor, a faculty member of Animal Science, who will act as chairperson of the committee, and a minimum of two other faculty members, one of whom may be outside of the Animal Science Department. The advisory committee approves the student’s coursework and research problem and conducts the final oral examination, which consists of a comprehensive oral examination and a defense of the thesis.

DOCTOR OF PHILOSOPHY
Animal Science Major

REQUIREMENTS

The doctoral program requires a minimum of 48 hours of coursework beyond the Bachelor of Science and a minimum of 24 hours of doctoral research and dissertation. The 48 hours of coursework must include

- A minimum of 16 hours in related fields outside of animal science.
- At least 24 hours credit at the 500- and 600-level, exclusive of doctoral research and dissertation, of which a minimum of six hours must be at the 600-level. Students in the nutrition, breeding, physiology, or anatomy concentration must complete at least 12 hours at the 500- and 600-level in the respective concentration or closely related area. Students in the management concentration must complete 12 hours at the 500- or 600-level in two non-management concentrations.
- A minimum of 1 hour of Agriculture 512 in addition to that required at the Master of Science level.
- A minimum of 6 hours in 400-, 500-, or 600-level statistics courses approved for the ICGSP.

A minimum of five faculty members will constitute the student’s advisory committee, of which at least one must be outside animal science. The major professor will be the chairperson. The student and the major professor select a program of study depending on the student’s area of concentration and professional goal. The advisory committee approves the coursework and the dissertation research proposal and determines if there is to be a foreign language requirement. The advisory committee conducts the comprehensive written and oral examination and the final dissertation defense examination.

Department of
BIOSYSTEMS ENGINEERING AND ENVIRONMENTAL SCIENCE
http://bioengr.ag.utk.edu

D. Raj Raman, Interim Head
Paul D. Ayers, Graduate Liaison

Professors
Ammons, J.T., PhD ...............................................................West Virginia
Ayers, P.D., PhD, PE ......................................................North Carolina State
Buschermohle, M.J., PhD ..................................................Clemson
Essington, M.E., PhD .......................................................California (Riverside)
Freeland, R.S., PhD, PE ...................................................Tennessee
Mote, C.R. (Assistant Dean, Tennessee Agricultural Experiment Station),
PhD, PE ........................................................................Ohio State
Tompkins, F.D. (Vice President for Research, UTK), PhD, PE ....Tennessee
Tyler, D.D., PhD ............................................................Kentucky
Wilkinson, J.B., PhD ........................................................Purdue
Wills, J.B., MS .................................................................Tennessee
Womac, A.R., PhD, PE .....................................................Tennessee
Yoder, D.C., PhD .............................................................Purdue

Associate Professors
Eash, N.S., PhD ...............................................................Iowa State
Grandle, G.F., Ph.D .......................................................Tennessee
Hart, W.E., PhD ...............................................................Purdue
Hayes, D.G., PhD ............................................................Michigan
Logan, J., PhD ..............................................................Nebraska
Radosyevich, M., PhD .................................................................Minnesota
Raman, D.R., PhD, PE ..............................................................Cornell
Savoy, H.J., PhD .................................................................Washington State
Walker, F.R., PhD ........................................................................North Carolina State

Assistant Professors
Buchanan, J.R., PhD, PE ............................................................Tennessee
Lee, J., PhD ................................................................................Iowa State
Leib, B.G., PhD ..........................................................................Penn State
Tyner, J.S., PhD ........................................................................Oklahoma State
Ye, X., PhD ................................................................................Minnesota

MAJORS DEGREES
Biosystems Engineering........................................................MS, PhD
Biosystems Engineering Technology.............................................MS
Environmental and Soil Sciences..................................................MS
Plants, Soils, and Insects..............................................................PhD

Graduate programs leading to the Master of Science and Doctor of Philosophy with a major in biosystems engineering are available to graduates of a recognized curriculum in engineering, mathematics, or one of the physical or biological sciences. A graduate program leading to the Master of Science in biosystems engineering technology is available to graduates in a recognized curriculum in agriculture or other related fields. These programs emphasize the application of engineering and engineering technology to agricultural and other biological systems. Major focus areas of the program are machinery systems; environmental quality and resource conservation; instrumentation, sensor, and control systems; and bioprocessing. Prerequisite courses may be required depending upon the applicant’s academic background and interest area within the program.

A graduate program leading to a Master of Science with a major in environmental and soil sciences is offered to graduates of recognized curricula in physical or biological sciences. The department also participates in the plants, soils, and insects Doctor of Philosophy program which is administered jointly by the departments of Biosystems Engineering and Environmental Science, Plant Sciences, and Entomology and Plant Pathology. For concentrations offered by these other departments, please see their sections in this catalog. Faculty in the Biosystems Engineering and Environmental Science Department administer the environmental and soil sciences master’s program and the environmental and soil sciences concentration in the plant, soils, and insects Doctor of Philosophy program. The master’s and doctoral programs are broad-based, emphasizing the application of chemical, biological, and physical principles to understand, manage, and manipulate the terrestrial environment. Within the concentration students may select an agricultural or non-agricultural focus area in soil and water chemistry; nutrient and elemental cycling; land management and reclamation; pedology; climatology; soil biology and biochemistry; contaminant transport; and soil physical processes.

A significant aspect of graduate education beyond formal courses and thesis projects is active participation in the professional community which exists within academic departments at universities. Student/faculty seminars are one of the professionally rewarding activities of the community. Accordingly, all graduate students are encouraged to participate in Biosystems Engineering 503 and other departmental seminars regardless of whether they are registered for seminar credit.

ADMISSION
A completed departmental data sheet and three completed Graduate Rating Forms are required in addition to the Application for Graduate Admission. Students must submit scores from the Graduate Record Examination. Each applicant will be advised about any prerequisite courses before entering a program. The student’s program of study must be approved by his/her advisory committee and must comply with the requirements of the Graduate Council.

MASTER OF SCIENCE
Biosystems Engineering Major

REQUIREMENTS
Applicants accepted into the program must complete at least 30 hours to earn a degree. Of these 30 hours, 20 must be in courses numbered 500 or greater (six hours of thesis plus 14 hours of other courses). Biosystems Engineering 503 Seminar (1) must be taken three times during the course of the program, the last of which must be in the student’s final semester before graduation. Other specific requirements for the 30 hours are:

<table>
<thead>
<tr>
<th>Hours</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>Thesis 500</td>
</tr>
<tr>
<td>12</td>
<td>Biosystems Engineering 503 (3 times 1 hr), 519, 543, and other major subject coursework</td>
</tr>
<tr>
<td>6</td>
<td>Coursework in computational methods</td>
</tr>
<tr>
<td>6</td>
<td>Program Electives</td>
</tr>
<tr>
<td></td>
<td>Total 30</td>
</tr>
</tbody>
</table>

Mathematics, computer science, statistics, or any course containing appropriate computational components that may be approved by the department.

In addition to completing the 30 hours, master’s students must pass a final oral examination covering the thesis, related areas, and graduate coursework.

MASTER OF SCIENCE
Biosystems Engineering Technology Major

REQUIREMENTS
Thesis Option
Applicants accepted into the program must complete at least 30 hours to earn a degree. Of these 30 hours, 20 must be in courses numbered 500 or greater (six hours of thesis plus 14 hours of other courses). Biosystems Engineering Technology 503 Seminar (1) must be taken three times during the course of the program, the last of which must be in the student’s final semester before graduation. Other specific requirements for the 30 hours are:

<table>
<thead>
<tr>
<th>Hours</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>Thesis 500</td>
</tr>
<tr>
<td>12</td>
<td>Biosystems Engineering Technology 503 (3 times 1 hr), 506, and other major subject coursework</td>
</tr>
<tr>
<td>6</td>
<td>Coursework in computational methods</td>
</tr>
<tr>
<td>6</td>
<td>Program Electives</td>
</tr>
<tr>
<td></td>
<td>Total 30</td>
</tr>
</tbody>
</table>

Mathematics, computer science, statistics, or any course containing appropriate computational components that may be approved by the department.
In addition to completing the 30 hours, master’s students must pass a final oral examination covering the thesis, related areas, and graduate coursework.

**Non-Thesis Option**

A non-thesis option in Biosystems Engineering Technology is available to qualified students. Applicants accepted into the program must complete at least 33 hours to earn a degree. Of these 33 hours, 20 must be in courses numbered greater than 500. Biosystems Engineering Technology 503 Seminar (1) must be taken three times during the course of the program, the last of which must be in the student’s final semester before graduation. Other specific requirements for the 33 hours are:

<table>
<thead>
<tr>
<th>Hours Credit</th>
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</thead>
<tbody>
<tr>
<td><strong>Biosystems Engineering Technology 503 (3 times 1 hour), 506, and other major subject coursework</strong></td>
</tr>
<tr>
<td>503 Seminar</td>
</tr>
<tr>
<td>Program electives</td>
</tr>
<tr>
<td>Coursework in special emphasis area</td>
</tr>
<tr>
<td>Capstone Experience (project and report, typically 508)</td>
</tr>
<tr>
<td><strong>Total 33</strong></td>
</tr>
</tbody>
</table>

1Mathematics, computer science, statistics, or any course containing appropriate computational components that may be approved by the department.

In addition to completing the 33 hours, non-thesis students must pass a comprehensive written final examination covering the graduate program, including the capstone experience. At the discretion of the candidate’s committee, an oral examination may also be required.

**MASTER OF SCIENCE**

**Environmental and Soil Sciences Major**

Students seeking a Master of Science degree with a major in environmental and soil sciences will generally concentrate their studies in one of the environmental and soil sciences focus areas. The focus areas include: soil and water chemistry; nutrient and elemental cycling; land management and reclamation; pedology, genesis, and classification; environmental climatology; soil biology and biochemistry; and soil physical processes. Both thesis and non-thesis options are available. Please see the environmental and soil sciences master’s concentration homepage for additional information: http://bioengr.ag.utk.edu/graduate/, or contact the environmental and soil sciences program’s graduate liaison.

**ADMISSION**

Applicants having bachelor’s degrees in fields that are related or unrelated to environmental and soil sciences may apply, although acceptance may be contingent upon the completion of prerequisite course work. Submit application, official transcripts, scores from the general portion of the Graduate Record Examination, and fee to the Graduate Admissions Office. In your application, indicate that you are applying to the environmental and soil sciences Master of Science program. Submit curriculum vitae, three letters of reference (or three Graduate Rating Forms), and a short statement of professional goals and reasons for applying to: Environmental and Soil Sciences’ Master’s Program Coordinator, Biosystems Engineering and Environmental Science Department, The University of Tennessee, 2506 E.J. Chapman Drive, Knoxville, Tennessee 37996-4531.

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**REQUIREMENTS**

**Thesis Option**

To obtain a Master of Science degree, the student must meet the following requirements, in addition to those of the Graduate Council (as specified in the Master’s Degree section at the front of this catalog).

- Upon consultation with the department head, the student will be assigned a major professor who acts as chair of the student’s advisory committee. The student and the major professor will assemble a graduate advisory committee consisting of the major professor and a minimum of two additional faculty, each holding the rank of assistant professor or above. At least one-half of the committee members must hold teaching appointments. The advisory committee must be formalized by the end of the second semester of graduate study.
- Develop and submit an approved program of study by the end of the second semester of graduate study. A minimum of 24 hours of graduate coursework is required in the program of study, exclusive of six hours of 500 Thesis. The program of study is subject to the approval of the student’s advisory committee, and must meet the following requirements.

<table>
<thead>
<tr>
<th>Hours Credit</th>
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</thead>
<tbody>
<tr>
<td><strong>503 Seminar</strong></td>
</tr>
<tr>
<td>Courses numbered above 503</td>
</tr>
<tr>
<td>Courses within the major (excluding courses numbered 503 and below)</td>
</tr>
<tr>
<td>500 Thesis</td>
</tr>
<tr>
<td><strong>Total 30</strong></td>
</tr>
</tbody>
</table>

1Courses that are in the major include those in environmental and soil sciences. In addition, Geology 510 and Environmental Engineering 535 are in the major. The student’s committee may require additional coursework beyond the 24 hours if the student’s progress or background indicates a need or deficiency.

- Develop a research problem and presentation by means of a written proposal to the student’s committee. This must be completed during the first two semesters of graduate study and before enrollment in 500.
- Pass a final oral exam that integrates the student’s thesis and coursework, administered by the advisory committee. The student is expected to be conversant in the soil and environmental sciences, particularly in the thesis and allied areas.
- Environmental and Soil Sciences 503 Seminar (1) must be taken three times during the course of the program, the last of which must be in the student’s final semester before graduation.

A student who has started a degree program under the thesis option is not eligible to transfer to the non-thesis option after the end of the first semester of graduate study or after receiving a graduate assistantship stipend for more than one semester.

**Non-Thesis Option**

A student desiring the non-thesis option must declare his/her intention before the beginning of the second semester of study. The student must meet the following requirements, in addition to those of the Graduate Council (as specified in the Master’s Degrees section at the front of this catalog).

- Upon consultation with the department head, the student will be assigned a major professor who acts as chair of the student’s advisory committee. The student and the major professor will assemble a graduate advisory
committee consisting of the major professor and a minimum of two additional faculty, each holding the rank of assistant professor or above. At least one-half of the committee members must hold teaching appointments. The advisory committee must be formalized by the end of the second semester of graduate study.

- Develop and submit an approved program of study by the end of the second semester of graduate study. A minimum of 33 hours of graduate coursework is required in the program of study. The program of study is subject to the approval of the student’s advisory committee, and must meet the following requirements.

**Hours Credit**

<table>
<thead>
<tr>
<th>Course Description</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>503 Seminar</td>
<td>3</td>
</tr>
<tr>
<td>593 Special Problems in Environmental and Soil Sciences</td>
<td>3</td>
</tr>
<tr>
<td>Courses numbered above 500 (exclusive of 593)</td>
<td>18</td>
</tr>
<tr>
<td>Courses within the major (excluding 500 and 502)</td>
<td>12</td>
</tr>
</tbody>
</table>

Courses that are in the major include those in environmental and soil sciences. In addition, Geology 510 and Environmental Engineering 535 are in the major. The student’s committee may require additional course work beyond the 33 hours if the student’s progress or background indicates a need or deficiency.

- In lieu of a thesis, students are required to complete three hours of 593 by participating in a single research program for a period of 12 weeks. The advisory committee approves the research problem. Satisfactory completion of this requirement requires a written, original research report that is acceptable to the student’s committee.
- Pass a comprehensive written examination that integrates the student’s course work and research problem. The exam is developed and administered by the advisory committee.
- Environmental and Soil Sciences 503 Seminar (1) must be taken three times during the course of the program, the last of which must be in the student’s final semester before graduation.

A student who has started a degree program under the non-thesis option may transfer to the thesis option upon approval of a potential major professor and the department head.

**DOCTOR OF PHILOSOPHY**

**Plants, Soils, and Insects Major - Environmental and Soil Sciences Concentration**

A doctorate with a major in plants, soils, and insects, with a concentration in environmental and soil sciences, is offered under a multi-departmental doctoral program. Three departments participate: Plant Sciences, Entomology and Plant Pathology, and the soils faculty in Biosystems Engineering and Environmental Sciences. Other concentrations within the Plants, Soils, and Insects doctoral program include horticulture, crop sciences, weed biology, plant improvement, entomology, plant pathology, integrated pest management and plant bioactive compounds. Focus areas in the environmental and soil sciences concentration include soil and water chemistry; nutrient management; pedology, genesis and classification; environmental climatology; soil biology and biochemistry; and soil physical processes. Please see the environmental and soil sciences doctoral concentration home page for additional information, http://bioengr.ag.utk.edu/graduate/, or contact a faculty member in the area of interest.

**ADMISSION**

Submit application, fee, official transcripts, and scores from the general portion of the Graduate Record Examination to the Graduate Admissions Office. In your application, indicate that you are applying to the plants, soils, and insects doctoral program. Submit resume, three letters of reference (or three Graduate Rating Forms), photocopy of Graduate Record Examination scores and a short statement of professional goals and reasons for applying to: Environmental and Soil Sciences Doctor of Philosophy Program Coordinator, Biosystems Engineering and Environmental Sciences Department, The University of Tennessee, Knoxville, 2506 EJ, Chapman Drive, Knoxville, Tennessee 37996-4531. In your statement letter and application, please indicate your interest in the environmental and soil sciences concentration.

**REQUIREMENTS**

To obtain the doctorate, the student must meet the following requirements.

- The student and the major professor will select a minimum of three additional faculty, holding the rank of assistant professor or above, to serve on the student’s doctoral committee. The major professor and two committee members must be approved to direct doctoral research by the Graduate Council, and at least half of the committee must hold teaching appointments. At least one member of the committee must be from outside the department. The doctoral committee must be formalized by the end of the second semester of graduate study.
- Submission of an approved program of study by the end of the second semester of graduate study. A candidate for the doctoral degree must complete a minimum of 24 hours of graduate coursework numbered 503 or higher beyond the master’s degree. Candidates not having a master’s degree must complete a minimum of 48 hours of graduate coursework beyond the baccalaureate degree, 24 hours of which must be numbered 503 or higher. A minimum of 12 of the 24 hours, or 30 of the 48 hours, must be graded A-F. At least nine hours of the student’s coursework must be from outside the Plants, Soils, and Insects major, and a minimum of six hours must be taken in University of Tennessee, Knoxville, courses numbered 601 or higher. In addition, 24 hours of course 600 Doctoral Research and Dissertation are required.
- Satisfactory preparation of a written dissertation proposal and its oral defense to the student’s committee. This must be completed during the first two semesters of graduate study and before enrollment in 600.
- Passing both written and oral sections of the comprehensive examination. The candidate will be tested on his/her knowledge of the proposed dissertation and related fields. The student is expected to be conversant in the wide area of soil and environmental sciences.
- Environmental and Soil Sciences 603 Seminar (1) must be taken three times during the course of the program, the last of which must be in the student’s final semester before graduation.
- Satisfactory preparation of a written dissertation and its oral defense to the student’s doctoral committee.

Please see the Degree Program Requirements/Doctoral Degrees section at the front of this catalog for additional information.
DOCTOR OF PHILOSOPHY
Biosystems Engineering

ADMISSION

Students applying for admission into the doctoral program must submit evidence of ability to perform and report independent research to the satisfaction of the faculty of the department. An approved master’s thesis will usually be acceptable for this purpose.

REQUIREMENTS

To earn a degree, each doctoral student must complete at least 75 hours of approved graduate credit (beyond the baccalaureate degree) in biosystems engineering and supporting areas (engineering, computational methods, agricultural and biological sciences, and other related areas). Of the 75 hours, 48 must be in courses numbered greater than 500 (including 24 hours of course 600) and six hours of courses at the University of Tennessee, Knoxville, numbered greater than 600. Other specific requirements for the minimum 75 hours are

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biosystems Engineering 619 and other major subject courses</td>
<td>18</td>
</tr>
<tr>
<td>1Coursework in computational methods</td>
<td>9</td>
</tr>
<tr>
<td>Program electives</td>
<td>24</td>
</tr>
<tr>
<td>Biosystems Engineering 603 Seminar (1)</td>
<td>3</td>
</tr>
<tr>
<td>600 Dissertation</td>
<td>24</td>
</tr>
<tr>
<td><strong>Total 75</strong></td>
<td></td>
</tr>
</tbody>
</table>

1. Mathematics, computer science, statistics, or any course containing appropriate computational components that may be approved by the department.
2. Must be taken three times during the course of the program, the last of which must be in the student’s final semester before graduation.

In addition to completing the minimum 75 hours of graduate credit required for a degree, each doctoral student must also pass a comprehensive examination as required by the Graduate Council.

Department of

ENTOMOLOGY AND PLANT PATHOLOGY

http://eppserver.ag.ukr.edu

Carl J. Jones, Head

Reid R. Gerhardt, Graduate Liaison

Professors

Bernard, E.C., PhD .........................................................Georgia
Bost, S.C., PhD .............................................................North Carolina State
Burgess, E.E., PhD ........................................................Tennessee
Gerhardt, R.R., PhD ......................................................North Carolina State
Grant, J.F., PhD ............................................................Clemson
Hale, F.A., PhD ..............................................................Ohio State
Jones, C.J., PhD ............................................................Wyoming
Lambdin, P.L., PhD .........................................................Virginia Tech
Newman, M.A., PhD .......................................................Texas A&M
Patrick, C.R., PhD .........................................................Mississippi State
Skinner, J.A., PhD .........................................................California (Davis)
Trigiano, R.N., PhD .......................................................North Carolina State
Windham, A.S., PhD ......................................................North Carolina State
Windham, M.T., PhD ......................................................North Carolina State

Associate Professors

Canaday, C.H., PhD .......................................................Ohio State
Gwinn, K.D., PhD ..........................................................North Carolina State
Lentz, G., PhD ...............................................................Iowa State
Ownley, B.H., PhD ........................................................North Carolina State
Stewart, S.D., PhD ........................................................Auburn
Vail, K.M., PhD ............................................................Florida

Assistant Professors

Hajimorad, M., PhD .........................................................Adelaide (Australia)
Lamour, K., PhD ...........................................................Michigan State
Moulton, J.K., PhD ........................................................Arizona

MAJOR DEGREES

Entomology and Plant Pathology ..........................................MS
Plants, Soils, and Insects ...................................................PhD

The Department of Entomology and Plant Pathology offers a graduate program leading to the Master of Science with a major in entomology and plant pathology, and the Doctor of Philosophy through the interdisciplinary plants, soils and insects program. Students in the entomology concentration may specialize in crop entomology, medical and veterinary entomology, insect biology, insect pest management, or biological control. Students in the plant pathology concentration may specialize in foliar and stem fungus diseases, soilborne pathogens, disease physiology, biocontrol, plant nematology, or virology. For specific information, contact the department head.

MASTER OF SCIENCE

Entomology and Plant Pathology Major

ADMISSION

For admission to the Master of Science program, a student must meet all requirements of the University of Tennessee, Knoxville, Graduate Council and must have completed (1) general botany or biology, eight hours; (2) advanced biological sciences, eight hours; (3) general inorganic chemistry, six to eight hours; (4) organic chemistry, three hours. In addition, three completed rating forms and a written statement of career goals and interest in entomology or plant pathology should be submitted to the department. Submit application, fee, official transcripts, and scores from the general portion of the Graduate Record Examination to the Graduate Admissions Office.

REQUIREMENTS

The program requires a written thesis based on original research and the completion of a minimum of 24 hours of coursework for graduate credit, approved by the student’s advisory committee. Included in the course requirements are two acceptable seminar presentations for one hour each. An oral final exam must be passed to the satisfaction of the advisory committee after the thesis has been completed. A minor is not required but may be selected at the option of the student. The minor will include at least six hours and not more than 10 hours of graduate-level credit in the minor department. The student’s committee shall include a member of the faculty from the minor department to assist in designating courses required for the minor.

DOCTOR OF PHILOSOPHY

Plants, Soils, and Insects Major • Entomology, Plant Pathology, Integrated Pest Management, Bioactive Natural Products Concentrations

A Doctor of Philosophy degree with a major in plants, soils and insects, with concentrations in entomology, plant pathology, integrated pest management, and bioactive natural products, is
offered under a multi-departmental doctoral program. Three departments participate: Plant Sciences, Entomology and Plant Pathology, and the soils faculty in Biosystems Engineering and Environmental Sciences. Other concentrations within the PSI major include horticulture, crop sciences, weed biology, plant improvement, and environmental and soil sciences. Please see the doctoral program links on the homepage of the Department of Entomology and Plant Pathology for additional information, http://eppserver.ag.utk.edu/, or contact a faculty member in the area of interest.

ADMISSION

Submit application, fee, official transcripts, and scores from the general portion of the Graduate Record Examination to the Graduate Admissions Office. In your application, indicate that you are applying to the plants, soils and insects doctoral program. Submit resume, three letters of reference (or three Graduate Rating Forms), photocopy of Graduate Record Examination scores and a short statement of professional goals and reasons for applying to Entomology and Plant Pathology Doctor of Philosophy Program Coordinator, Department of Entomology and Plant Pathology, 2431 Joe Johnson Drive, 205 Plant Sciences Building, The University of Tennessee, Knoxville, Tennessee, 37996-4560. In your statement letter and application, please indicate your concentration of interest and intended major professor.

REQUIREMENTS

To obtain the doctorate, the student must meet the following requirements.

- The student and the major professor will select a minimum of three additional faculty, holding the rank of assistant professor or above, to serve on the student’s doctoral committee. The major professor and two committee members must be approved to direct doctoral research by the Graduate Council, and at least half of the committee must hold teaching appointments. At least one member of the committee must be from outside the department. The doctoral committee must be formalized by the end of the second semester of graduate study.

- Submission of an approved program of study by the end of the second semester of graduate study. A candidate for the doctoral degree must complete a minimum of 24 hours of graduate coursework numbered 503 or higher beyond the master’s degree. Candidates not having a master’s degree must complete a minimum of 48 hours of graduate coursework beyond the baccalaureate degree, 24 hours of which must be numbered 503 or higher. A minimum of 12 of the 24 hours, or 30 of the 48 hours, must be graded A-F. At least nine hours of the student’s coursework must be from outside the Plants, Soils, and Insects major, and a minimum of six hours must be taken in University of Tennessee courses numbered 601 or higher. In addition, 24 hours of course 600 Doctoral Research and Dissertation are required.

- Satisfactory preparation of a written dissertation proposal and its oral defense to the student’s committee. This must be completed during the first two semesters of graduate study and before enrollment in 600.

- Passing both written and oral sections of the comprehensive examination. The candidate will be tested on his/her knowledge of the proposed dissertation and related fields.

- Presentation of at least two departmental seminars (two hours of Entomology and Plant Pathology 640), in addition to an exit seminar (no credit).

- Satisfactory preparation of a written dissertation and its oral defense to the student’s doctoral committee.

Please see the Degree Program Requirements/Doctoral Degrees section at the front of this catalog for additional information.
MASTER OF SCIENCE
Food Science and Technology Major

Applicants must have a Bachelor of Science in food technology, food science, or a related scientific field.

REQUIREMENTS
Thesis Option
- Prior to research for the thesis, the student must develop a detailed written research plan. Registration for six hours of 500 Thesis is required.
- In addition to the thesis requirement, a minimum of 24 hours of graduate coursework is required. This work must be approved by the student’s committee and a minimum of 14 hours must be courses numbered above 500. The committee may require additional coursework if the student’s progress or background indicates such need.
- All students are required to take two hours of 501 Seminar in their program and are expected to attend this course and participate in discussions during their master’s program. Completion of 510 or equivalent is also required.
- An oral, final examination covering the thesis and coursework is required.

Non-Thesis Option
- In lieu of a thesis, students are required to complete a problem in cooperation with their employer (company or governmental agency) and their faculty committee. Students working on a problem must register for six hours of 503.
- In addition to the requirement for six hours of 503, a minimum of 24 hours of graduate coursework is required. This work must be approved by the student’s committee and a minimum of 14 hours must be courses numbered above 500. The committee may require additional coursework if the student’s progress or background indicates such need.
- All students are required to take two hours of 501 Seminar in their program and are expected to attend this course and participate in discussions during their master’s program. Completion of 510 or equivalent is also required.
- Students will be required to take a written comprehensive examination covering their coursework. In addition, an oral, final examination covering the problem and coursework is required. The oral examination will be held on the Knoxville campus.

DOCTOR OF PHILOSOPHY
Food Science and Technology Major

REQUIREMENTS
- Completion of a master’s degree in the field, or a closely related field, or passing a special qualifying examination is required for admission.
- A dissertation is required for the Doctor of Philosophy degree. Each student must develop a detailed written plan for the dissertation research.
- A minimum of 72 hours beyond the bachelor’s degree, excluding credit for the master’s thesis, is required. Of this, 24 hours must be 600 Doctoral Research and Dissertation.
- At least 24 hours of coursework numbered above 500 are required exclusive of doctoral research and dissertation. At least six of the 24 hours must be courses numbered above 600.
- A minimum of six hours of courses for graduate credit must be taken outside the Department of Food Science and Technology.
- All candidates must complete 601 (two hours) and are expected to attend 601 during their Doctor of Philosophy program.
- Each candidate must pass both written and oral comprehensive examinations prior to admission to candidacy. Major professors will advise candidates on competencies expected. A final oral examination is required that includes a defense of the dissertation and subject matter that the student’s committee considers appropriate.

Department of
FORESTRY, WILDLIFE AND FISHERIES
http://fwf.ag.utk.edu/

George M. Hopper, Head and Graduate Liaison

Professors
Buchler, D.A., PhD .................................................................Virginia Tech
Dearden, B.L., PhD .................................................................Colorado State
Fly, J.M., PhD ...........................................................................Michigan
Hodges, D.G., PhD .................................................................Georgia
Hopper, G.M., PhD .................................................................Virginia Tech
Houston, A.E., PhD .................................................................Tennessee
Ostermeier, D.M., PhD ...........................................................Syracuse
Rials, T.G., PhD .................................................................Virginia Tech
Schlarbaum, S.E., PhD ...........................................................Colorado State
Speer, C.A., PhD .................................................................Utah State
Strange, R.J., PhD ...............................................................Oregon State
Wilson, J.L., PhD .................................................................Tennessee

Associate Professors
Buckley, D.S., PhD .................................................................Michigan Tech
Clatterbuck, W.W., PhD ..........................................................Mississippi State
Harper, C.A., PhD .................................................................Clemson
Young, T.M., MS .................................................................Tennessee

Assistant Professors
Eda, S, PhD..............................................................................Japan
Franklin, J.A., PhD .................................................................Alberta (Canada)
Gray, M.J., PhD .................................................................Texas Tech
Harper, D.P., PhD .................................................................Washington State
Muller, L.L., PhD .................................................................Georgia
Taylor, M.M., PhD ...............................................................Oregon State
Wang, S., PhD ........................................................................Nanjing Forestry (China)

Instructors
Minser, W.G, MS .................................................................Tennessee
Moschler, W., MS .................................................................Virginia Tech

Adjunct Faculty
Albright, R., PhD .................................................................Southern Illinois
Clark, J.D., PhD .................................................................Arkansas
Franzreb, K., PhD ...............................................................Arizona State
Reams, G.A., PhD .................................................................Maine
Van Manen, F., PhD ............................................................Tennessee

Emeriti Faculty
Buckner, E.R., PhD ...............................................................North Carolina State
Dimmick, R.W., PhD ..............................................................Wyoming
Hay, R.L., PhD .......................................................................Duke
Graduate study leading to the Master of Science with majors in forestry and in wildlife and fisheries science and the Doctor of Philosophy with a major in natural resources is offered by the Department of Forestry, Wildlife and Fisheries.

The mission of the Department of Forestry, Wildlife and Fisheries is to advance the management, utilization, and appreciation of natural resources in Tennessee, the region and beyond through programs in teaching, research and extension.

MASTERS DEGREES

Forestry ................................................. MS
Wildlife and Fisheries Science .......................... MS
Natural Resources .................................................. PhD

NON-THESIS OPTION (Forestry major only)

- Prior to research for the thesis, the student is required to develop a detailed written research proposal. Registration for six hours of thesis (Forestry 500 or Wildlife and Fisheries Science 500) is required.
- A graduate committee of no fewer than three faculty members must be selected by the second semester of residence. At least one member shall be from outside the department. In addition to the thesis requirement, a minimum of 24 hours of graduate coursework is required. This work must be approved by the student’s committee and no more than 10 hours of the minimum 30 can be below the 500 level. The committee may require additional coursework if the student’s progress or background indicates such need.
- All students are required to include Forestry 512 or Wildlife and Fisheries Science 512 Seminar, in their programs. This is required of each graduate student in residence fall semester.
- An oral examination covering the thesis and coursework is required.

DOCTOR OF PHILOSOPHY

NATURAL RESOURCES MAJOR

The doctoral program with a major in natural resources emphasizes interdisciplinary research approaches toward the understanding and management of natural resources in a broad context. Areas of study include forest, wildlife, and fisheries biology; ecosystem function and structure; natural resource economics and policy; human dimensions of natural resource management; natural resource organization administration and management; wood sciences; and multidisciplinary natural resources management.

ADMISSION

Applicants to the Doctor of Philosophy program normally should have completed a master’s degree prior to beginning the doctoral program. Specific admission requirements include:

- A minimum grade point average of 3.0 on a 4.0 scale
- A minimum composite score from the general Graduate Record Examination on the verbal, quantitative, and analytical sections of 1650, with a minimum of 1100 on the verbal and quantitative sections
- A statement of professional goals, natural resource management philosophy, and reasons for applying to the program
- Three letters of reference from individuals capable of evaluating the applicant’s potential for graduate work in interdisciplinary natural resource management

REQUIREMENTS

A candidate for the doctoral degree must complete 72 hours of coursework beyond the bachelor’s degree. Forty-eight hours must be in graduate coursework approved by the student’s doctoral committee. Up to 24 hours of master’s-level coursework may be applied to the 48-hour requirement. A minimum of six hours must be taken in university courses at the 600 level, exclusive of dissertation hours. Specific requirements are:

Research Methods and Analysis (nine credits in at least two of the subject areas)

- Research/Experimental Design
- Statistics/Econometrics/Biometrics
- GIS/Remote Sensing

Core Subject areas (33 credits to be determined by doctoral committee)
Professional Development (six credits)

- Teaching—All students will be expected to complete Forestry, Wildlife and Fisheries 601 and assist in teaching a course during their tenure in the program.
- Problem Solving—Forestry, Wildlife and Fisheries 610 will be required of all doctoral students. This course will include participation in an interdisciplinary team to address a significant national or regional natural resource issue.
- Professional Communications—All students will be required to complete Forestry, Wildlife and Fisheries 612 as part of their program of study. Part of the seminar requirement will consist of assisting in the development and conduct of Forestry, Wildlife and Fisheries 512.

Forestry, Wildlife and Fisheries 600 Doctoral Research and Dissertation (24 credits)

A doctoral committee consisting of at least four faculty members must be identified by the student and major professor. At least two of the committee members must be from the Department of Forestry, Wildlife and Fisheries and one member must be from an academic unit other than Forestry, Wildlife and Fisheries. Three of the committee members, including the major professor, must be approved by the Graduate Council to direct doctoral research. The committee should be formed during the first year of the student’s program.

All students are required to successfully complete an oral and written examination on all coursework completed as part of the Doctor of Philosophy requirements. The exam is scheduled when the student has completed all or nearly all of the coursework. The Doctor of Philosophy committee will determine the content, nature, and schedule of the comprehensive exam and certify the results.

During the first year, the student should develop a research prospectus that outlines the research problem to be addressed as part of his/her doctoral research. The prospectus is presented to the student’s committee and the committee will approve the research topic and approach.

All students are required to complete, present, and defend a dissertation. The student should provide each member of the committee a copy of the dissertation at least two weeks prior to the scheduled defense. All students are required to present a seminar on their dissertation as part of the degree requirements. The seminar can be part of the dissertation defense or presented before the formal defense.

Environmental Policy Minor

The department participates in a program designed to give graduate students an opportunity to develop an interdisciplinary specialization in environmental policy. See Department of Economics for program description.

Department of

PLANT SCIENCES

http://plantsciences.uky.edu/

G. Neil Rhodes, Head
Dennis R. West, Graduate Liaison

Professors

Albrecht, M.L. (Associate Dean), PhD ................................................ Ohio State
Allen, F.L., PhD ........................................................................ Minnesota
Augé, R.M., PhD .............................................................Washington State

Bates, G.E., PhD ........................................................................ Georgia
Denton, H.P., PhD ................................................................. North Carolina State
Deyton, D.E., PhD ................................................................. North Carolina State
Hayes, R.M., PhD ........................................................................ Illinois
Lockwood, D.W., PhD ................................................................ Purdue
McDaniel, G.L., PhD ................................................................. Iowa State
Miller, R.D., PhD ................................................................. Kentucky
Mueller, T.C., PhD ................................................................. Georgia
Rhodes, G.N., PhD ................................................................. North Carolina State
Samples, T.J., PhD .................................................................... Oklahoma State
Sams, C.E., PhD ........................................................................ Michigan State
Stewart, C.N., PhD (Rachefield Chair) ........................................ Virginia Tech
West, D.R., PhD ........................................................................ Nebraska

Associate Professors

Cheng, Z.M., PhD ........................................................................ Cornell
Guthmayh, C.O., PhD .............................................................. California (Davis)
Hamilton, S.L., EdD ........................................................................ Louisiana State
Klingeman, W.E., PhD ................................................................. Georgia
Menendez, G.L., MS ...................................................................... Tennessee
Pantalone, V.R., PhD ............................................................... North Carolina State
Robinson, D.K., PhD ................................................................. North Carolina State
Rogers, S.M., MLA .......................................................................... Georgia
Stewart, C.E., MLA ........................................................................ Georgia

Assistant Professors

Chen, Feng, PhD ................................................................. California (Davis)
Craig, C.C., PhD ............................................................................ Louisiana State
Garton, S., PhD ........................................................................... Minnesota
Kopsell, D.A., PhD ........................................................................ Georgia
McElroy, S., PhD ........................................................................ North Carolina State
Sorohan, J.C., PhD ........................................................................ Michigan State
Steckel, L.E., PhD .......................................................................... Illinois
Straw, R.A., PhD ........................................................................ Tennessee
Thompson, M.A., PhD ................................................................. Tennessee
Zale, J.M., PhD .............................................................................. Saskatchewan

Instructor

Flanagan, P.C., MS ........................................................................... Tennessee

Adjunct Faculty

Arelli, Prakash Ph.D. ....................................................................... Georgia
Brown-Faust, James E., PhD .......................................................... Michigan
Bunick, Gerald J., PhD ................................................................. Pennsylvania
Conway, William S., PhD .............................................................. New Hampshire
Karpinski, Tatiana V., PhD ............................................................. Russia
Ott, R.J., MBA .............................................................................. Georgia
Rivero, Raoul E., ED.D ................................................................. Tennessee
Sobek, Edward A., PhD ................................................................. Texas
Tschapilinski, Timothy, J., PhD ..................................................... Toronto
Wullschleger, Stan, PhD ............................................................... Arkansas

Emeriti Faculty

Ashburn, E.L., PhD .......................................................................... Tennessee
Callahan, Lloyd, Ph.D. ................................................................. Rutgers
Coffey, D.L., PhD ........................................................................... Purdue
Conger, Bob V., PhD ....................................................................... Washington State
Flinchum, Wayne, PhD ................................................................. Louisiana
Fribourg, H.A., PhD ...................................................................... Iowa State
Graham, Effin, PhD ......................................................................... Pennsylvania
Jared, John R., PhD ................................................................. Tennessee
Reich, Vernon H., PhD. ................................................................. Iowa State
Reynolds, John H., PhD ............................................................... Wisconsin
Sams, D.W., PhD ........................................................................... Minnesota
Wyatt, J.E., PhD ................................................................. Florida

MAJORS

DEGREES

Plant Sciences................................................................................. MS
Plants, Soils, and Insects................................................................. Ph.D
The Department of Plant Sciences offers two graduate degrees—the Master of Science with a major in plant sciences and the Doctor of Philosophy with a major in plants, soils, and insects. For additional information, please visit our departmental homepage. Inquiries may be directed to the Chair, Graduate Committee, Department of Plant Sciences, The University of Tennessee, Knoxville, Tennessee 37996-4561, or uthort@utk.edu.

MASTER OF SCIENCE PROGRAM

Plant Sciences Major

Both thesis and non-thesis options are available for the major in plant sciences, each guided by a graduate committee consisting of the major professor and two or more other faculty members. Studies are possible in a wide variety of commodities and subject areas, including fruits, vegetables, weeds, cereals, grains, turfgrass, woody ornamentals, and public horticulture. Students may specialize in one or more disciplines, including plant protection, molecular biology, breeding, genetics, biotechnology, physiology, ecology, culture, and management.

ADMISSION

Students should have a bachelor’s degree from an accredited college or university, with evidence of ability to do work of graduate quality. Applicants are expected to have a minimum cumulative grade point average of 2.7 on a 4.0 scale.

Application must be made to both the Office of Graduate Admissions and the Department of Plant Sciences. The departmental application requires three letters of reference (or three Graduate Rating Forms) from persons capable of assessing the applicant’s suitability for graduate work in plant science, résumé, and a statement of professional goals and reasons for applying to the program. Applicants are also required to submit scores from the general Graduate Record Examination to Graduate Admissions (please send photocopy to department). Successful applicants will usually have a composite score on the verbal, mathematical and analytical sections of the Graduate Record Examination of at least 1400. Prior undergraduate course work in mathematics, biology and chemistry is recommended.

REQUIREMENTS

- Approval of the academic program by the master’s committee.
- Successful completion of 12 hours of course work in the major at the graduate level (400 or above), exclusive of Plant Sciences 500, 502, and 503. Two of these hours must be Plant Sciences 504. Six of these hours may be satisfied by Biochemistry and Cellular and Molecular Biology 404, 521, 522, Animal Science 571, Environmental and Soil Sciences 434, 444, 516, Ecology and Evolutionary Biology 414, 431, 520, 560, Information Sciences 560, Art 481, or Geography 439.
- Presentation of at least two departmental seminars.

Please see the Degree Program Requirements/Master’s Degrees section at the front of this catalog for additional information.

Thesis Option

- Satisfactory preparation of a written thesis proposal and its oral defense to the student’s committee.
- Successful completion of 30 hours of graduate credit, which must include six hours of 500. At least 14 of these hours must be numbered 501 or above.
- Preparation of a written thesis and its oral defense.

Non-Thesis Option

- Successful completion of 34 hours of graduate credit, which must include 2-4 hours of Plant Science 503. At least 22 of these hours must be at the 500 level or above.
- Completion of a project and preparation of a written report summarizing the project.
- Passing written and oral examinations covering the project and course work.

DOCTOR OF PHILOSOPHY

Plants, Soils, and Insects Major · Horticulture, Crop Sciences, Weed Biology, Plant Improvement

Concentrations

The Doctor of Philosophy with a major in plants, soils and insects, with concentrations in horticulture, crop sciences, weed biology, and plant improvement, is offered under a multi-departmental doctoral program. Three departments participate: Plant Sciences, Entomology and Plant Pathology, and the soils faculty in Biosystems Engineering and Environmental Sciences. Other concentrations within the Plants, Soils, and Insects major include environmental and soil sciences, entomology, plant pathology, integrated pest management and bioactive natural products. Please see the Plant Sciences homepage for additional information, http://plantsciences.utk.edu, or contact a faculty member in the area of interest.

Students may select a formal concentration as a focus of study but this is not a requirement. We recognize that modern research approaches in plant sciences often overlap. Students may specialize in one or more approaches, including plant biotechnology, molecular biology, breeding, genetics, physiology, ecology, culture and management. Research may feature fruits, vegetables, turfgrass, weeds, woody ornamentals, cereals, grains, fiber, public horticulture or model plant systems.

ADMISSION

Submit application, fee, official transcripts, and scores from the general portion of the Graduate Record Examination to the Graduate Admissions Office. In your application, indicate that you are applying to the Plants, Soils and Insects doctoral program. Submit resume, three letters of reference (or three Graduate Rating Forms), photocopy of Graduate Record Examination scores and a short statement of professional goals and reasons for applying to: Plant Sciences Doctor of Philosophy Program Coordinator, Department of Plant Sciences, 2431 Joe Johnson Drive, 252 Plant Sciences Building, The University of Tennessee, Knoxville, Tennessee 37996-4561. In your statement letter and application, please indicate your concentration of interest and intended major professor.
REQUIREMENTS

To obtain the doctorate, the student must meet the following requirements.

- The student and the major professor will select a minimum of three additional faculty, holding the rank of assistant professor or above, to serve on the student’s doctoral committee. The major professor and two committee members must be approved to direct doctoral research by the Graduate Council, and at least half of the committee must hold teaching appointments. At least one member of the committee must be from outside the department. The doctoral committee must be formalized by the end of the second semester of graduate study.

- Submission of an approved program of study by the end of the second semester of graduate study. A candidate for the doctoral degree must complete a minimum of 24 hours of graduate coursework numbered 503 or higher beyond the master’s degree. Candidates not having a master’s degree must complete a minimum of 48 hours of graduate coursework beyond the baccalaureate degree, 24 hours of which must be numbered 503 or higher. A minimum of 12 of the 24 hours, or 30 of the 48 hours, must be graded A-F. At least nine hours of the student’s coursework must be from outside the plants, soils, and insects major, and a minimum of six hours must be taken in University of Tennessee courses numbered 601 or higher. In addition, 24 hours of course 600 Doctoral Research and Dissertation are required.

- Satisfactory preparation of a written dissertation proposal and its oral defense to the student’s committee. This must be completed during the first two semesters of graduate study and before enrollment in 600.

- Passing both written and oral sections of the comprehensive examination. The candidate will be tested on his/her knowledge of the proposed dissertation and related fields.

- Presentation of at least two departmental seminars (two hours of Plant Sciences 504), in addition to an exit seminar (no credit).

- Satisfactory preparation of a written dissertation and its oral defense to the student’s doctoral committee.