Franklin College of
Arts and Sciences
UNIVERSITY OF GEORGIA

CURRICULUM REQUEST FORM

Please complete a separate request for each curriculum item being submitted. Each request should include either a WORD or PDF file of the curriculum item being reviewed. This form along with the file should be emailed to Kris Petti at pettik@uga.edu.

Date: 2/09/2026

Department/Institute/Program: Institute for Artificial Intelligence

Contact Person: Frederick Maier

Email Address: fmaier@uga.edu

Curriculum Item Request: Proposal for New Graduate Certificate

Please provide a justification for this request:

The Institute for Artificial Intelligence proposes to create a *Graduate Certificate in Artificial Intelligence – Forestry*. The graduate certificate is intended to build and enhance the skills that are necessary to apply AI methodologies for addressing complex problems associated with the management of forests and forest-centered supply chains, and to provide students with knowledge and skills that may be useful in evaluating both the technical quality of AI-generated solutions and the potential ethical and societal implications of using AI and the outcomes. Warnell School of Forestry will assist in managing the certificate. The program will ideally expose students to the capabilities of AI to assist in collecting, processing, and analyzing forest-based information with the purpose of improving the ability of landowners, foresters, and forest managers to effectively, efficiently, and sustainably manage United States forests. These enhancements to the educational foundation of graduate students should position them well to communicate AI concepts and outcomes to forest business leaders, land and resource managers, forest landowners, and other stakeholders of the forest industry in the United States.

As Department Head, you are affirming that the department procedures have been followed for approval with your unit.

Prashant Doshi, Ph.D.
Executive Director
Institute for Artificial Intelligence

PROPOSAL FOR A CERTIFICATE PROGRAM

Date: January 1, 2026

School/College/Unit: Franklin College of Arts and Sciences
Office of the Senior Vice President for Academic Affairs and Provost

Department/Division: Institute for Artificial Intelligence (IAI)

Certificate Title: Graduate Certificate in Artificial Intelligence - Forestry

CIP: 3050210

Effective Term: Fall 2026

Which campus(es) will offer this certificate? Athens

Level (Undergraduate, Graduate, or Post-Baccalaureate): Graduate

Program Abstract

The Graduate Certificate in Artificial Intelligence – Forestry is intended to allow students to receive recognition for pursuing educational activities that provide a knowledge base and foundation for understanding principles and techniques of artificial intelligence (AI) and how AI might be used effectively to address contemporary issues in the field of forestry. The graduate certificate is intended to build and enhance the skills that may be necessary to apply AI methodologies for addressing complex problems associated with the management of forests and forest-based supply chains, and to provide students with knowledge and skills that may be useful in evaluating both the technical quality of AI-generated solutions and the potential ethical and societal implications of these outcomes. The program will ideally expose students to the capabilities of AI to assist in collecting, processing, and analyzing forest-based information with the purpose of improving the ability of landowners, foresters, and forest managers to effectively, efficiently, and sustainably manage United States forests. These enhancements to the educational foundation of graduate students should position them well to communicate AI concepts and outcomes to forest business leaders, land and resource managers, forest landowners, and other stakeholders of the forest industry in the United States. The proposed certificate is suited for any graduate student enrolled in the Warnell School of Forestry and Natural Resources with an interest in how AI applications can address the accuracy and effectiveness of precision forestry measurement and management processes, and the efficiency expected of forest businesses and associated supply chains.

1. Purpose and Educational Objectives

State the purpose and educational objectives of the program. How does this program complement the mission of the institution?

Artificial intelligence has played a subtle role in the management of forests for over 50

years through the use of simulation and heuristic search (planning) and regression methods (growth and yield) that assist professionals with the management of forest resources. However, advances in artificial intelligence technology in the last decade (mainly large language models and machine learning methods) have accelerated the need for a highly trained professional forester workforce that can integrate large and diverse databases with advanced analytical techniques. In the field of forestry, AI tools can inform critical decision-making processes, shape land management recommendations, and influence operational, tactical, and strategic planning efforts. However, many graduate forestry programs have not formally integrated AI coursework and training into their curricula, leaving graduates underprepared to apply these transformative technologies in a responsible, ethical, and effective manner. The proposed Graduate Certificate in *Artificial Intelligence - Forestry* aims to address this gap by providing forestry graduate students with the foundational knowledge and hands-on experience they may need to succeed in business environment that is rapidly evolving. Aligned with the University's mission to foster high levels of student achievement and deliver a robust, supportive teaching environment, this initiative will equip graduate students with essential AI competencies that will serve them throughout their professional and personal lives.

2. Need for the Program

Explain why this program is necessary.

The proposed graduate certificate requires computation-oriented training, training in the ethical and social implications of AI, and exposure to relevant use cases in forest management and planning. The certificate will complement existing graduate degree programs provided by the Warnell School of Forestry and Natural Resources. For students seeking to obtain a master of science in forest resources (thesis-based), master of forestry (non-thesis), or doctoral degree majoring in forestry, a graduate certificate in AI would provide a clear signal of the student's interest in and training for roles in the workforce that involve AI.

Artificial intelligence technology can be used to enhance the efficiency and effectiveness of forest management, including aspects of management that concern the planning of forest management activities, the logistics of implementing them, and the communication of outcomes to stakeholders. Processes such as machine learning and advanced data analysis techniques are becoming increasingly important in forestry, as they allow efficient predictions of the growth of trees and areas at risk of disease, and efficient analysis of satellite, aerial, and drone imagery that help describe forest condition (Jing et al. 2023). However, as Holzinger et al. (2024) note, there is limited expertise among forestry professionals to use advanced artificial intelligence technologies, and specialized training programs that integrate artificial intelligence into forestry curricula seem necessary today.

In addition, provide the following information:

a. Semester/Year of Program Initiation: **Fall 2026**
b. Semester/Year of Full Implementation of Program: **Fall 2026**
c. Semester/Year First Certificates will be awarded: **Fall 2027**
d. Annual Number of Graduates expected (once the program is established): 30

e. Projected Future Trends for number of students enrolled in the program: 40+

3. Student Demand

a. Provide documentation of evidence of student demand for this program, including a student survey.

In an effort to broadly gauge interest in an AI certificate that might be offered through the University of Georgia, a survey was developed to gauge interest of students. The survey was created and sent to the IAI Faculty Fellows, along with a request to forward the survey to listservs in their unit. There are currently over 90 faculty fellows of the IAI, representing many diverse areas of study across the University of Georgia campus. The survey was also sent to undergraduate coordinators or advisors associated with the following units:

- College of Family and Consumer Sciences
- Department of Chemistry
- Department of English
- Department of Geography
- Department of History
- Department of Linguistics
- Department of Management Information Systems
- Department of Philosophy
- Department of Physics and Astronomy
- Department of Psychology
- Division of Biological Sciences
- Mary Frances Early College of Education
- School of Computing
- School of Public and International Affairs

Of the 294 students who responded to this survey as of Fall 2024, 80% agreed or strongly agreed that they would consider pursuing the certificate. When asked whether an AI certificate program would complement their current degree program and/or provide skills they anticipate needing in their career after graduation, 77% agreed or strongly agreed. About 89% of the students agreed or strongly agreed that it was important to them that an AI certificate would provide training to understand how AI tools work, and training to understand how to successfully employ this technology. A slightly smaller set (84% of the students) were hopeful (agreed or strongly agreed) that an AI certificate program would provide them training on how to create new, or modify existing, AI technologies.

The undergraduate BSFR-Forestry major program at the University of Georgia consists of 125 credits of pre-professional and professional coursework that meets the *Forestry Standard* accreditation requirements of the Society of American Foresters. Although students pursuing this degree need to take 9 hours of elective course, an undergraduate certificate in AI with a forestry emphasis would likely be of little interest due to the heavy programming requirements.

However, students pursuing graduate degrees in forestry at the University of Georgia are

often required to develop skills that would position themselves well for a graduate AI certificate. Therefore, a survey was developed (and approved by IRB) for current forestry graduate students to ascertain whether they would be interested in pursuing the graduate certificate. Of the 32 students who responded, 87% agreed or strongly agreed that they would consider pursuing the certificate. When asked whether the proposed certificate program would complement their current degree program and/or provide skills they anticipate needing in their career after graduation, 77% agreed or strongly agreed. About 93% of the students agreed or strongly agreed that it was important to them that the certificate would provide training to understand how AI tools work, and training to understand how to successfully employ this technology. A slightly smaller set (80% of the students) were hopeful (agreed or strongly agreed) that the certificate program would provide them training on how to create new, or modify existing, AI technologies. And 90% of the students indicated (agreed or strongly agreed) that it was important that the certificate provided training in the ethical use of AI and potential societal implications of using AI.

b. Provide evidence that demand will be sufficient to sustain reasonable enrollment.

Given the results noted above from the survey of forestry graduate students, the faculty do not believe that continued demand will be an issue.

4. Program of Study

Provide a detailed program of study for the certificate program, including:

a. Specific course prefixes, numbers, and titles

The graduate certificate program requires the completion of at least 13 graduate credit hours within four Groups of courses. Some of these specific courses may also require prerequisites which students will need to complete. Students completing the graduate certificate must earn a grade of "C" (2.0) or better in each of the required courses. Students are expected to take one foundational course covering the fundamentals of artificial intelligence and one foundational course addressing the ethics of artificial intelligence.

Group 1: Fundamentals of Artificial Intelligence (3-4 hours)
Choose one of the following courses.
AESC 6200, Artificial Intelligence (AI) in Agriculture: Principles and Applications (3 hours)
ARTI 6555, Foundations of Machine Learning (3 hours)
CSCI 6380, Data Mining (4 hours)
CSCI(ARTI) 6550, Artificial Intelligence (3 hours)
CSCI(ARTI) 8950, Machine Learning (4 hours)
GEOG 6591, Introduction to Geospatial Artificial Intelligence, (3 hours)

Group 2: Ethics of Artificial Intelligence (3 hours)
Choose one of the following courses.
ARTI(PHIL) 6340, Ethics and Artificial Intelligence (3 hours)
MIST 7440, AI in Business and Society (3 hours)

In addition, students are expected to complete at least two forestry domain courses that have significant content related to artificial intelligence, and at least one other course in a domain closely related to forestry that has significant content related to artificial intelligence.

Group 3: Forestry Elective Courses (6-7 hours)
Choose two of the following courses.
FANR 7630, Statistical Software for Natural Resource Management (3 hours)
FANR 7640, Unmanned Aerial Systems' (UAS) Role in Natural Resource Management (3 hours)
FORS 7690, Applied Geographic Information Systems (GIS) for Forest Resource Management (3 credits)
FORS 8011, LiDAR Remote Sensing (3 hours)
FORS 8450, Advanced Forest Planning (3 hours)

Finally, students will be required to demonstrate knowledge and understanding of artificial intelligence through a one-hour independent study course. The topic and objective are: Develop and describe in a short, professional report, the application of some form of artificial intelligence that may specifically benefit the management of the Whitehall Forest, an 800-acre University of Georgia land holding in Clarke County.

Group 4: Application to Forest Management (1 hour)
FORS 7980 or 8980, Forestry Problems (1 hour - under the direction of a forestry faculty member)

The list of approved electives may be expanded as new offerings from within the Warnell School of Forestry and Natural Resources and across the University of Georgia are approved for inclusion. The faculty will use the following criteria to evaluate these electives for inclusion in the certificate.

For courses to be included in Group 1, the course should contain content that represents the foundations of artificial intelligence across a broad array of application areas. For a course to be included in Group 2, the course content should focus specifically (75% or more) on the ethics of using artificial intelligence to address issues of importance to society. For courses to be regarded as electives in Group 3, the course content should focus predominantly (65% or more) on the application of artificial intelligence methods to issues of importance directly related to the practice of forestry.

Identify any new courses created for this program.

No new courses will be created for this program.

5. Model Program and Accreditation

a. *Identify any model programs, accepted disciplinary standards, and accepted curricular practices against which the proposed program could be judged. Evaluate the extent to which the proposed curriculum is consistent with these external points of reference and provide a rationale for significant inconsistencies and differences that may*

exist.

At the University of Georgia there are two certificate programs that focus on AI. One is the undergraduate *Certificate in Artificial Intelligence – Computing*. This certificate includes one course requirement for foundational skills, and one course requirement for ethics. The second is the undergraduate *Undergraduate Certificate in Artificial Intelligence - Business*. This program also includes one course requirement for foundational skills, and one course requirement for ethics. Both of these programs contain discipline-specific elective courses that focus on different areas of concentration within their domains. The business AI certificate also requires a programming language course.

An assessment was conducted of colleges and universities where there are forestry programs accredited under the *Forestry Standard* of the Society of American Foresters. The assessment reviewed the presence of graduate certificate programs available to all students across all programs, yet the primary focus was to learn whether there were any AI certificates that focused on forestry concepts. The colleges and universities included the following:

Abraham Baldwin Agricultural College
Alabama A&M University
California Polytechnic State University - San Luis Obispo
California Polytechnic State University - Humboldt
Clemson University
Colorado State University
Duke University
Iowa State University
Louisiana State University
Louisiana Tech University
Michigan State University
Michigan Technological University
Mississippi State University
New Mexico Highlands University
North Carolina State University
Northern Arizona University
Ohio State University
Oklahoma State University
Oregon State University
Paul Smith's College of Arts and Sciences
Pennsylvania State University
Purdue University
Salish Kootenai College
Southern Illinois University
State University of New York - College of Environmental Science and Forestry
Stephen F. Austin State University
Texas A&M University
University of Arkansas at Monticello
University of British Columbia
University of California - Berkeley
University of Florida
University of Idaho
University of Kentucky
University of Maine
University of Massachusetts - Amherst

University of Minnesota
University of Montana
University of New Hampshire
University of Tennessee
University of Vermont
University of Washington
University of Wisconsin-Madison
University of Wisconsin-Stevens Point
Utah State University
Virginia Polytechnic Institute and State University
Washington State University
West Virginia University
Yale University

With respect to graduate certificate programs that focused on AI and forestry, only one was closely related. Yale University offers an *Environmental Data Science Certificate* with courses that include:

- Data Foundations
- Data Stewardship
- Data Cleaning & Analysis
- Data Communication
- Mapping Spatial Data
- Text to Data Applications
- Capstone

The design of this graduate certificate program is somewhat similar to what we have proposed, as it includes foundational coursework and a capstone course. However, it does not appear to include (a) an ethics course, and (b) forestry-specific courses.

A number of other organizations offer graduate certificates that are closely related to AI and forestry. For example, the University of Florida offers both *Applications in AI-based SmartAg Systems* and *Mapping with Unmanned Aerial Systems*. Many of the organizations noted above offer a remote sensing or geographic information systems graduate certificate program (e.g., Duke University, Louisiana Tech, Maine, Michigan Technological University, Mississippi State University, New Mexico Highlands University, North Carolina State University, Ohio State University, Southern Illinois University, and others). Graduate certificates in general AI and machine learning are offered at California Polytechnic State University - Humboldt, University of Missouri, Ohio State University, Texas A&M University, University of Washington, and several others. Business analytics (data analysis, data science) graduate certificates, which may include AI concepts, are offered at Abraham Baldwin Agricultural College, Colorado State University, Michigan Technological University, Purdue University, University of California - Berkeley, University of Massachusetts - Amherst, and several others.

b. If program accreditation is available, provide an analysis of the ability of the program to satisfy the curricular standards of such specialized accreditation.

There are no accreditation bodies for AI programs.

6. Student Learning Outcomes

Describe the proposed learning outcomes for the certificate program.

Upon completing the certificate, students should be able to:

- Explain the important, fundamental dimensions of the various AI methods.
- Understand how AI can enhance the ability of a landowner, forester, or forest manager to effectively, efficiently, and sustainably manage a forest.
- Describe to others how AI may influence the financial, social, and ecological values of forests.
- Know how to practice ethical, respectful, and professional behavior when using AI.

While the courses from all four groups described above would ideally address some or all of the intent of these four learning outcomes, more directly the first learning outcome can be addressed by a course taken from the set Group 1, and the final learning outcome can be addressed by a course taken from Group 2. Courses selected from Groups 3-4 should act to address the second and third learning outcomes.

7. Assessment and Admissions

Describe how the learning outcomes for the program will be assessed. Describe the process and criteria for how students will be admitted to and retained in the program.

While the graduate certificate targets students pursuing MS, MFR, and PhD forestry degrees within the Warnell School of Forestry and Natural Resources, admission to the certificate will not be restricted to students enrolled in these degree programs. However, deviations from, and substitutions of, the approved coursework will not be freely accommodated. Any proposed adjustments may be approved on a case-by-case manner by the Associate Director for Academic Programs for the Institute for Artificial Intelligence and the current forestry faculty liaison (initially Dr. Pete Bettinger). And, students who are interested in pursuing the graduate certificate will need to work directly with a forestry faculty member to undertake the 1-hour Forestry Problems (FORS 7980) course. While there are other areas of study within the Warnell School of Forestry and Natural Resources (fisheries, recreation, soils, water, wildlife) and other units on the UGA campus that may provide a 1-hour graduate-level "problems" course, this one course needs to be facilitated by a forestry faculty member. Students who are interested in pursuing the graduate certificate should meet with their graduate program committee to determine an appropriate plan of study before submitting an enrollment request via Athena. Students pursuing the graduate certificate should also meet regularly with their graduate program committee to discuss progress in earning the certificate.

Assessment of the Program Learning Outcomes will be performed using tests, reports, papers, and other graded assignments in each of the courses comprising the graduate certificate. Collectively, the courses comprising the certificate program ensure that each program learning outcome is covered. Review of the certificate program will occur annually through the use of an exit survey taken by graduating students. The certificate will eventually be present in the Xitracs system, where progress and assessments of learning outcomes can be tracked.

8. References

Holzinger, A., J. Schweier, C. Gollob, A. Nothdurft, H. Hasenauer, T. Kirisits, C. Häggström, R. Visser, R. Cavalli, R. Spinelli, K. Stampfer. 2024. From Industry 5.0 to Forestry 5.0: Bridging the gap with human-centered artificial intelligence. *Current Forestry Reports*. 10(6): 442-455.

Jing, W., Z. Kuang, R. Scherer, and M Wozniak. 2023. Editorial: Big data and artificial intelligence technologies for smart forestry. *Frontiers in Plant Science*. 14: 1149740.

Documentation of Approval and Notification

Proposal: Graduate Certificate in Artificial Intelligence - Forestry

College: Franklin College of Arts and Sciences, Office of the Senior Vice President for Academic Affairs and Provost

Department:

Proposed Effective Term: Fall 2026

School/College:

Use of course approvals are pending for the proposed program.

Institute for Artificial Intelligence
UNIVERSITY OF GEORGIA

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January 19th, 2026

RE: **Memorandum of Understanding for Graduate Certificate in AI - Forestry**

I. Purpose

This agreement guides the administrative and academic responsibilities of the Institute for Artificial Intelligence and the Warnell School of Forestry and Natural Resources regarding the management of the Graduate Certificate in Artificial Intelligence – Forestry.

II. Personnel

- **Unit Contacts:** Each participating unit will designate one or more faculty members to serve as the contact person for the program. Each contact person will serve as a representative of their respective unit and be able to advise students regarding certificate requirements.
- **Program Coordinator**: One of the contact persons will serve as Program Coordinator, with the initial coordinator being from the Institute for Artificial Intelligence.

III. Administrative Responsibilities

The Program Coordinator has the following responsibilities:

- **Admissions**: Formally admit students into the certificate program using the Athena system.
- **Serving as Graduation Clearance Officer:** This includes verifying that certificate requirements have been met and processing the Graduation Roster each term.
- **Reporting:** Managing assessment and reporting of Program Learning Outcomes using the Xitracs system.

IV. Assessment of Program Learning Outcomes

Review of the certificate program will occur annually through the use of an exit survey taken by graduating students. Other methods of assessment will be decided by mutual agreement between the units. The unit contacts are jointly responsible for ensuring that assessment materials are collected annually and made available to the program coordinator.

V. Course Offerings:

Each participating unit will ensure that courses under their control and needed to fulfill certificate requirements are offered on a regular basis. Also, each unit will strive to ensure that students enrolled in the certificate program are granted permissions to register for these courses.

Prashant Doshi, Ph.D.
Executive Director
Institute for Artificial Intelligence

Pete Bettinger, Ph.D.
Hargreaves Professor of Forest Management
Warnell School of Forestry and Natural Resources