

From: [Smith, Randy](#)
To: [Miller, Dustin](#); [Voithofer, Rick](#)
Cc: [Sutherland, Sue](#); [Smith, Randy](#); [Griffiths, Rob](#); [Reed, Katie](#); [Duffy, Lisa](#); [Hunt, Ryan](#); [Warnick, Bryan](#); [Locascio, Pete](#); [Snyder, Anastasia](#)
Subject: Proposal to establish a Computer Science Endorsement 5b Certificate
Date: Thursday, November 20, 2025 1:18:22 PM
Attachments: [image001.png](#)

Dusty and Rick:

The proposal from the Department of Educational Studies to establish a Computer Science Endorsement 5b Certificate was approved by the Council on Academic Affairs at its meeting on November 19, 2025. Thank you for attending the meeting to respond to questions/comments.

No additional level of internal review/approval is necessary. This action will be included in the Council's next Annual Activities Report to the University Senate (July 2026).

The Office of the University Registrar will work you with any implementation issues.

Please keep a copy of this message for your file on the proposal and I will do the same for the file in the Office of Academic Affairs.

If you have any questions please contact the Chair of the Council, Professor Sue Sutherland (.43), or me.

I wish you success with this important program development.

Randy



W. Randy Smith, Ph.D.

Vice Provost for Academic Programs

Office of Academic Affairs

University Square South, 15 E. 15th Avenue, Columbus, OH 43201

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Assisted by:

Katie Reed

Executive Assistant

(614) 292-5672

TO: Randy Smith, Vice Provost for Academic Programs

FROM: Graduate School Curriculum Services

DATE: 10/15/2025

RE: Proposal to Establish a Computer Science Endorsement 5b Certificate in The College of Education and Human Ecology

The Department of Educational Studies in Coordination with the Department of Teaching and Learning and Computer Science in the College of Education and Human Ecology and the College of Engineering is proposing a Computer Science Endorsement 5b Certificate.

The proposal was received by the Graduate School on 5/30/2025. The combined GS/CAA subcommittee first reviewed the proposal on 10/08/2025 and requested revisions. Revisions were received on 10/14/2025. It is supported for review by the Council on Academic Affairs.

Memo

May 30, 2025

To: Graduate School Curriculum

From: Pete Locascio, Executive Director of Undergraduate Education, EHE

RE: NEW PROGRAM REQUEST: **Computer Science Endorsement**, Department of Educational Studies,
Department of Teaching and Learning, Department of Computer Science and Engineering.

Please find materials included in this proposal related to the creation of a new certificate.

This was approved by the EHE Curriculum Committee on December 12, 2024.

If there are any questions, please contact me at Locascio.7@osu.edu

Kowalsky, Lisa

From: Sivilotti, Paul
Sent: Tuesday, October 14, 2025 10:27 AM
To: Kowalsky, Lisa; Locascio, Pete
Subject: RE: GS/CAA Review Meeting Feedback: Computer Science Endorsement 5b
Attachments: OSU-CSTE-5bCertificate-Proposal-2025-10-14.pdf

Hi Lisa--

Oh! Yes, I was looking for the typo in the wrong spot. Thanks for clearing that up! Attached is the updated proposal. We've addressed the committee's feedback as follows:

- 1) It was noticed that there is a typo on the first page that states "*consumer science endorsement*", rather than computer science. Please correct.

Ok. Pete will provide an updated cover letter shortly. Hopefully things can proceed concurrently while that typo gets fixed.

- 2) It was noted by a colleague in EHE that the course number 5225 already exists (ESEPOL 5225). The existing course has a very different emphasis. It is recommended that the planned course number be changed so as not to confuse students.

No change. These courses have different subject codes (ESEPOL vs ESLTECH) so there is no conflict. We appreciate this well-intentioned suggestion, and it was discussed amongst the units involved in EHE. However, it was agreed that the possibility of student "confusion" wasn't high enough to warrant a renumbering ESLTECH 5225 so as to avoid any such number-overlap with other courses.

- 3) Thank you for sharing the Expected Learning Outcomes (ELO) for this certificate. We request that you also include an Assessment plan.

Done. An assessment plan has been included (p. 8-9).

- 4) Although we've discussed this prior to submission, the subcommittee requests that you include the minimum cGPA as 3.0.

Done. The minimum cGPA has been included (p. 7).

Thanks for the feedback, and for your help going forward.

Best wishes,
--paul



Dr. Paul A. G. Sivilotti
Associate Professor
College of Engineering Dept. of Computer Science & Engineering

Proposal for the Creation of a Professional Certification: Computer Science Endorsement

Submitted by:

The Department of Teaching and Learning (EHE)
The Department of Educational Studies (EHE)
The Department of Computer Science and Engineering (ENG)

Feb 21, 2025

Revised: October 14, 2025

I Program Definition

Program Title

Computer Science Endorsement

Certificate Category (and Justification)

This certificate will serve as the academic preparation program for the Ohio State Board of Education Supplemental Teaching Endorsement for K-12 teachers in the field of Computer Science. As such, it will be pursued by teachers who already hold their Ohio teaching license. In addition to completing this certificate, earning the state endorsement also requires an embedded practicum and passing a standardized content-area exam.

These Ohio licensure and supplemental endorsement requirements correspond to the stand-alone, graduate-level, credit-bearing Professional Certification characteristics of **certificate category 5b**.

Program Overview

A new Computer Science Endorsement program is proposed for K-12 teachers in Ohio. This initiative is a collaboration between the College of Education and Human Ecology's Department of Teaching and Learning, the Department of Educational Studies, and the College of Engineering's Department of Computer Science and Engineering.

The endorsement includes five required courses, 15 credits total, designed to accommodate teachers with varying levels of prior experience in computer science. Educators who complete the program will be qualified to teach computer science from elementary through high school, including both Computer Science courses in the College Board's Advanced Placement Program: Computer Science Principles and Computer Science A. To accommodate different levels of programming and teaching experience, three different pathways through the computer science core of the curriculum are

available. Two of these pathways can be completed fully online, while the third, appropriate for only a small percentage of teachers (those with sufficient prior computer science experience), requires in-person components.

By taking three courses during the summer, and then one course per semester during the academic year, teachers will be able to complete the certificate in one calendar year.

Program Purpose and Rationale

In today's rapidly evolving digital landscape, the importance of computer science (CS) education cannot be overstated. However, in Ohio, there remains a significant gap in CS education within K-12 schools. As of the 2019-2020 academic year, only 50% of Ohio's public high schools offered foundational computer science courses, leaving half of the state's high school students without access to essential CS education. While Computer Science endorsements are offered by universities in northern and southern regions of Ohio, there are not currently any CS endorsement programs in central Ohio.

This lack of exposure at the K-12 level contributes to a broader issue: a substantial workforce gap in the state's technology sector. Each year, the disparity between available computing jobs and qualified graduates in Ohio widens by over 11,000 positions. This shortfall not only hampers the state's economic growth but also means that many students miss out on lucrative career opportunities, given that the average annual salary in CS occupations in Ohio is \$30,000 higher than the median household income.

To address these challenges, we plan to offer the Computer Science Endorsement program, designed to equip educators with the skills and knowledge necessary to effectively teach computer science to K-12 teachers. This program can be completed online over one year, providing flexibility for working professionals. By completing this endorsement, educators will be better prepared to introduce and teach computer science concepts in their classrooms, thereby expanding access to CS education across the state.

Method of Delivery

The primary modality of the program will be DL (distance learning), in that a pathway through the curriculum exists consisting of entirely DL courses. We expect this pathway to be the pathway with the largest enrollment. This primary pathway, however, is supplemented with some IP (in person) alternatives and electives.

As detailed in the Curriculum section below, there are two curricular components to the program: (i) a pedagogical component and (ii) a computer science technical component.

The pedagogical component consists of two courses, both of which will be available as DL:

- ESLTech 5225 Coding Across the K12 Curriculum. This is a new course, developed specifically for this program and with this audience (adult learners, practicing professionals, licensed teachers in Ohio) in mind. It is designed for DL delivery.

- ESTL 5721 Methods in Teaching STEM Secondary Science. This is currently an in-person course. A new asynchronous online section of the course will be developed in collaboration with OSU Online (OSO) to serve the endorsement.

Within the computer science curricular component, some courses are DL and others are IP. All of these courses already exist in the designated modality, so no change of modality is needed for this program. The only course design modification is the transition of CSE 6011 from synchronous DL to asynchronous DL to better accommodate a working professional audience. The computer science courses and modalities are:

- DL courses (existing, no changes proposed)
 - CSE 6011 Computational Thinking
 - CSE 6012 Programming in Java
 - CSE 6013 Data Structures in Java
 - TDA 5621 Big Data (DL)
 - CSE 5471 Cybersecurity (DL)
- IP courses (existing, no changes proposed)
 - CSE 5022 Software I
 - CSE 5023 Software II
 - CSE 5052 Survey of Artificial Intelligence
 - CSE 6520 Foundations of Artificial Intelligence

Effective Date

Pending approval, the program is set to launch in Summer 2025.

Program Goals and Expected Learning Outcomes

The program goals for the endorsement, along with the expected learning outcomes that support each goal, are given by the following list.

Upon completion of the Computer Science Endorsement certificate, the graduate will be able to...:

Goal 1. ...demonstrate proficiency in core computer science concepts.

Supporting learning outcomes:

- Understand and apply fundamental principles of computer science, including data representation, algorithm development, and programming.
- Analyze and design algorithms to solve problems effectively.
- Comprehend the workings of digital devices, systems, and networks.
- Evaluate the societal impacts of computing advancements.

Goal 2. ...design and implement effective computer science instruction.

Supporting learning outcomes:

- a. Develop and deliver engaging computer science lessons and units using effective teaching methodologies.
- b. Create inclusive and accessible learning environments that promote digital citizenship.
- c. Utilize technology-based tools to support authentic assessment of student learning.

Goal 3. ...integrate technology to enhance learning.

Supporting learning outcomes:

- a. Align technology interventions with student learning goals to enhance educational outcomes.
- b. Utilize technology-based tools to support authentic assessment of student learning.

Goal 4. ...foster an inclusive computing culture.

- a. Promote and model an inclusive computing culture that encourages collaboration and effective communication around computing concepts.
- b. Recognize and address the diverse needs of all students in the computer science classroom.

Goal 5. ...understand and apply ethical and safe computing practices.

- a. Explain how social and cultural factors influence how students learn with technology.
- b. Create and maintain safe, ethical, supportive, fair, and effective learning environments for all students.
- c. Apply ethical considerations in the use of technology and data in the classroom.

Curriculum

The certificate curriculum consists of five courses: two core courses in pedagogy related to CS and STEM education in a K12 setting, and three courses related to programming and technical skills in computer science.

The pedagogy core consists of:

1. ESLTec 5225 Coding Across the Curriculum
2. ESTL 5721 Methods in Teaching STEM Secondary Science

For the computer science component, we anticipate that teachers will come to this endorsement program with different levels of familiarity with programming and computer science.

1. Most teachers will be novices, with little or no prior programming experience. For these teachers, the course sequence begins with an introduction to computer science principles: CSE 6011 Computational Thinking in Context.
2. Other teachers, however, will have some exposure to programming and for these the 6011 coursework would be unnecessary. For example, these teachers may be qualified to teach AP CS Principles, but not AP CS A. These teachers will begin with CSE 6012, a course focused on Java Programming, which is the programming language of instruction in the AP CS A curriculum.
3. A few teachers will arrive with programming experience in Java, but wishing to extend and deepen their understanding of more advanced concepts such as software engineering, artificial intelligence, data analytics, security, etc. These teachers will begin with CSE 5022, Software Components 1. For students who wish to enroll in this option, a placement test is available to assess proficiency in problem solving with an imperative programming language.

The third course in the computer science sequence affords the opportunity for an elective to pursue a particular area (AI, cybersecurity, data analytics).

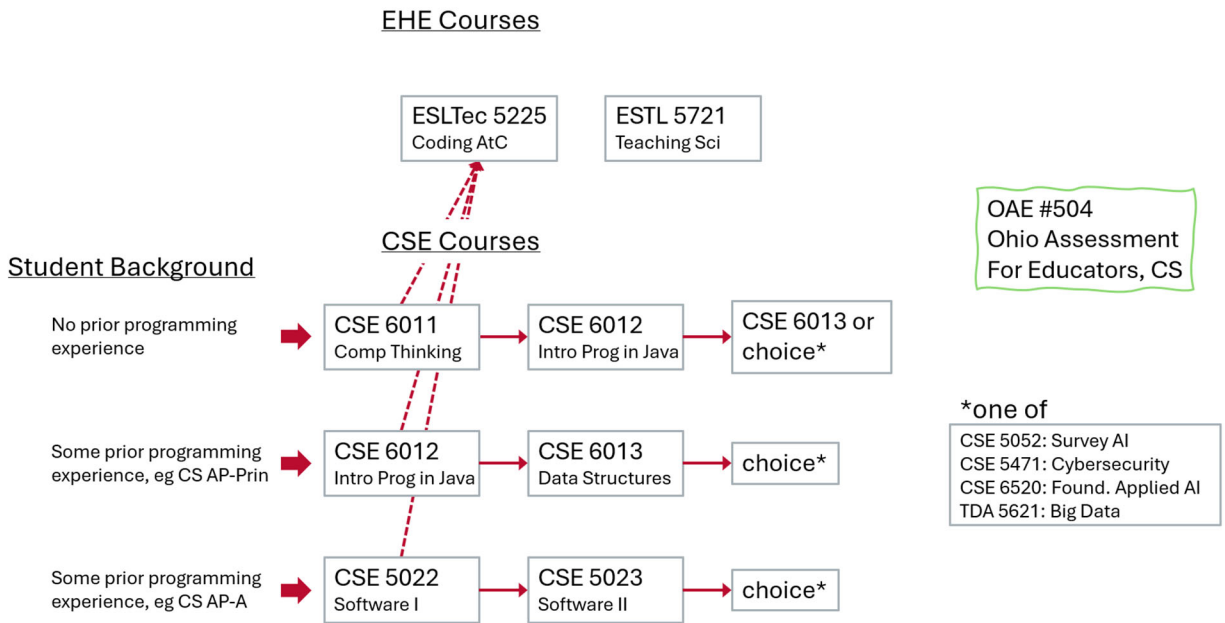


Figure 1: Overview of the three curricular pathways through the program, depending on student background

These three pathways, including pre/co-requisite requirements, are illustrated in Figure 1. This figure also includes the Ohio Department of Education technical area test (OAE #504) which is a requirement for obtaining the teaching endorsement from the state of Ohio. The

Computer Science coursework in this certificate program is in support of successful completion of the OAE #504 assessment.

The advising sheets for each pathway are given below:

Option 1: Designed for teachers with no programming experience. This option is available completely online.

<i>Required:</i>	<i>Hours</i>
CSE 6011 Computational Thinking in Context	3
CSE 6012 Introduction to Computer Programming in Java	3
Choose 1 course from CSE 6013 Data Structures Using Java CSE 6520 Foundations of Applied Artificial Intelligence for Non-Majors CSE 5052 Survey of Artificial Intelligence for Non-Majors GRADTDA 5621: Big Data Computing Foundations I	3
ESTL 5721 - Methods in Teaching Sciences: Nature of Scientific Knowledge	3
ESLTECH 5225- Coding Across the Curriculum	3
	15

Option 2: Designed for teachers with experience teaching AP-Computer Science Principles but limited programming experience. This option is also available completely online.

<i>Required:</i>	<i>Hours</i>
CSE 6012 - Introduction to Computer Programming in Java	3
CSE 6013 - Data Structures Using Java	3
Choose 1 course from CSE 6520 Foundations of Applied Artificial Intelligence for Non-Majors CSE 5052 Survey of Artificial Intelligence for Non-Majors GRADTDA 5621: Big Data Computing Foundations I	3
ESTL 5721 -Methods in Teaching Sciences: Nature of Scientific Knowledge	3

ESLTECH 5225- Coding Across the Curriculum	3
	15

Option 3: Designed for teachers with AP-Computer Science Principles teaching experience and substantial programming experience, as demonstrated by passing a placement test. Teachers on this pathway will be required to take two in-person courses (CSE 5022 & CSE 5023), offered in the summer and multiple times during the academic year.

Placement test information: <https://cse.osu.edu/current-students/undergraduate/advising-office/csecis-placement-exam>

Required:	Hours
CSE 5022 Software I: Software Components	3
CSE 5023 Software II: Software Development and Design	3
Choose 1 course from	3
CSE 6520 Foundations of Applied Artificial Intelligence for Non-Majors	
CSE 5052 Survey of Artificial Intelligence for Non-Majors	
GRADTDA 5621: Big Data Computing Foundations I	
ESTL 5721 -Methods in Teaching Sciences: Nature of Scientific Knowledge	3
ESLTECH 5225- Coding Across the Curriculum	3
	15

All of the courses in this certificate program are letter-graded. Students must achieve a cumulative graduate GPA of at least a 3.0 to be considered for the awarding of the certificate. Only grades of “A” through “C-” may be counted toward the completion of the certificate program. Additional Graduate School rules pertaining to 5b certificates are described in the [Graduate School Handbook, section 8.3](#). In particular: Students may not transfer graduate credits earned at another institution to a graduate certificate program.

Upon successful completion of all required coursework and the appropriate Ohio Assessments for Educators (OAE) exam (code 054), candidates will need to submit their licensure application and payments through the Ohio Department of Education (ODE) website.

Assessment Plan

The degree to which the program meets its intended goals and student learning outcomes will be measured through a combination of four in-program assessments (IP) and one post-program result (PP). In particular, data will be gathered from the following assessments:

Assessment 1 (IP): Lab activities and comprehensive exams students, where students will demonstrate their ability to:

- Apply CS and computational thinking practices in flexible and appropriate ways
- Apply knowledge of computing systems
- Model networks and the Internet and apply security practices
- Use and analyze data
- Develop programs and interpret algorithms
- Analyze impacts of computing and analyze impacts of computing, including current CS subjects

Assessment 2 (IP): Programming assignments, lab activities and comprehensive exams, where students will demonstrate their ability to:

- Use basic coding features provided by high-level imperative programming languages
- Write computer programs to implement given simple algorithms, using simple data structures such as arrays, as appropriate
- Use methods and classes to help produce well-structured programs
- Read and program using libraries
- Design simple text-oriented user interfaces

Assessment 3 (IP): In-class presentations and discussions, where student teachers are expected to:

- Understand and appreciate computer science as a human endeavor, with an emphasis on socio-cultural and historical features of science.
- Examine the dimensions of (computer) science learning defined by the state of Ohio through its Academic Content Standards.
- Increase familiarity with a range of instructional strategies that promote learning through active engagement of students.
- Gain proficiency in using laboratory facilities, Web-based resources, and other materials to promote continuous self-development as an education specialist.
- Explicate critical linkages among the related fields of science, technology, engineering and mathematics that relate to the goals of (computer) science education.
- Examine issues and concerns related to the teaching of (computer) science in schools that will enable student teachers to anticipate and constructively respond

to safety, ethical, legal, and controversial issues within (computer) science classrooms.

Assessment #4 (IP): Lesson Plan Development, where students engage in an iterative lesson planning process that results in a product suitable for future teaching. The lessons will integrate multiple evidence-based pedagogical techniques to teach computer science topics. The lesson planning materials will demonstrate an understanding and application of teaching diverse students, selecting appropriate content for the teaching context and learners, such as pedagogical approaches for teaching coding, opportunities for integration with other content areas, and assessment and evaluation strategies. Lesson plans will be justified using relevant research. Students will demonstrate their ability to:

- Create comprehensive, inclusive, and flexible assessments for computer science education.
- Ensure these assessments align with learning objectives to accurately evaluate students' understanding of programming, computational thinking, and problem-solving skills.
- Employ a variety of assessment methods, including projects, quizzes, and peer reviews, to cater to diverse learning styles and promote deep engagement with the subject matter.

Assessment #5 (PP): Success in passing the Ohio Assessment for Educators (OAE) exam for Computer Science (code 054).

For IP assessments (ie #1–#4), exemplars of student work and grading rubrics will be gathered from instructors in the following courses:

- Assessment #1: CSE 6011, 6012, or 5022 (depending on student pathway)
- Assessment #2: CSE 6011, 6012, or 5022 (depending on student pathway)
- Assessment #3: ESLTech 5225
- Assessment #4: ESLTech 5225

For all assessments (ie #1–#5), examples of good, average, and poor student work will be reviewed and analyzed for opportunities of program improvement. In the first 3 years of the program, this review will be done annually. After that, review will be carried out in alternating years.

Length of Program Compared to Similar Programs

The following colleges and universities in Ohio offer the Computer Science Endorsement

Institution	Program Name	Credit Hours	Notes
Bowling Green State University	Computer Science Educator Endorsement	12	Fully online program that can be completed in six months.
Kent State University	Computer Science Endorsement Preparation	21	Designed for educators seeking to incorporate computer science into their curriculum.
Malone University	Computer Science Endorsement	15	Fully online program formatted in a cohort model, can be completed within one year.
Miami University	Computer Science Endorsement (PK-12)	20	Requires a sequence of five computer science courses and a teaching methods course.
Heidelberg University	K-12 Computer Science Endorsement	13	Consists of four courses totaling 13 credit hours.
Cleveland State University	Computer Science Endorsement Program	18	100% online program that can be completed in three semesters.
Mount St. Joseph University	Computer Science Graduate Endorsement Program	15	Fully online program completed over three semesters.
University of Cincinnati	Computer Science Endorsement	18	Online competency-based program leading to an Ohio teaching credential.

II Adequate Enrollment

Projected Enrollment

The endorsement expects a ramp-up in enrollments over the next five years based on the population served. Ultimately, we hope to enroll approximately 20 new teachers each year. Given the population served, we expect more coursework to be completed during the summer semester. Assuming a completion pattern where students enroll at the beginning of one summer (for multiple courses) and then complete the endorsement in one calendar year (i.e., at the end of the following autumn semester), we should enroll an average of

approximately 20 students during the summers (for multiple courses) and 20 students during the academic year (for one course per semester).

Projections for New Enrollments in the Proposed

Year	Summer 25	'26	'27	'28	'29
Cohort	1	2	3	4	5
# Teachers	10	12	14	18	20

This projection is supported by a grant awarded to Ohio State from the Department of Education (TeachCS) to fund the full cost of attendance for a cohort of teachers in this endorsement program. The grant supports a cohort of 10 teachers in the initial year, and 20 students in the second year.

The computer science component consists of many more course options than can be populated by students in this endorsement program alone. To support this range of course options, this endorsement program uses existing CS courses, with enrollment from other populations of students, including matching undergraduate offerings.

Opportunities for Graduates

1. The Computer Science Endorsement qualifies the graduates to teach AP computer science in Ohio high schools.
2. This certificate program gives teachers the skills to incorporate algorithmic thinking and computer science principles in domain-specific contexts across the K-12 curriculum. Middle school and elementary school teachers will also be positioned to enrich their classroom content in various domain areas (e.g., math, statistics, sciences, humanities, arts)

Admissions Policy

The certificate will be available to K-12 teachers carrying a current Ohio teaching certificate. Applicants must declare their intent to pursue the Computer Science Endorsement and completed applications require official college transcripts and evidence of a current Ohio teaching license.

Assessment of applicants and advising of students in the Computer Science component of the curriculum will be done by the Graduate Advisor in the department of Computer Science and Engineering. This advice will include, in particular, guidance for which of the three options through the Computer Science curricular core of this endorsement is appropriate for the applicant.

III Sufficient Resources

No new facilities or staff hires are expected for this program.

The certificate is a collaborative effort between the departments of Teaching and Learning (EHE), Educational Studies (EHE), and Computer Science and Engineering (ENG). As such, the administrative responsibilities are partitioned and coordinated between the three units. Periodic program review, as required by the Ohio Dept. of Higher Education, will be conducted in collaboration by the faculty leads in each unit (currently Prof. Rick Voithofer, Prof. Lin Ding, and Prof. Paul Sivilotti).

The college of Education and Human Ecology (EHE) is already the home of 7 teaching endorsement programs: Bilingual, Computer/Technology, Middle Childhood Generalist, Reading, Special Education: Pre-K Special Needs, Teacher Leader, and Teaching English to Speakers of Other Languages. The Computer Science endorsement would be the eighth. As such, EHE has considerable expertise in managing, tracking, and delivering such programs.

As such, EHE will be responsible for processing the endorsement submissions to the State Board of Education (transcripts, contact hour documentation, test results, etc.) and consulting on such requirements. Student inquiries, both from students wanting this endorsement as well as those seeking Professional Development credit (for which the courses in this program serve) will be fielded through EHE, as will communication and outreach activities.

The students will be advised by Graduate Advisor in the Department of Computer Science. This advice will include the selection of an appropriate pathway through the computer science curricular options, the approval of any course substitutions or waivers (e.g., if they already have transferable CS course work), and the selection of appropriate elective course. Students' progress will be tracked through the program. CSE will also be responsible for the review of applications, distribution of grants, reporting to the state about grant allocations, and management of program enrollment EHE's Accreditation, Placement, and Licensure.

The Ohio Assessment for Educators Computer Science test (OAE 540) can be a significant challenge for completing the state endorsement requirements. To help address this challenge, CSE will provide test preparation resources for students enrolled in this certificate. At least once a year, the department will offer a test prep webinar by a domain expert to refresh and prepare students for the kinds of questions they are likely to encounter in OAE 540.

IV Justifiable Expenses

Course additions or deletions

Addition: ESLTech 5225: Coding Across the Curriculum

Description: This course will introduce teachers to various methods for teaching coding and Computer Science within K-12 education. It will provide teachers with the essential skills and knowledge needed to develop coding and Computer Science curricula in schools. Throughout the course, teachers will study effective strategies for teaching computer coding to K-12 students and fostering computational thinking skills across different subjects and grade levels.

Available and anticipated funding

In 2023, the state of Ohio allocated \$8 million (to be disbursed over several fiscal years) to support K-12 computer science instruction through the “Teach CS” program. The goal of Teach CS is to increase “the number of existing teachers who qualify to teach computer science” through supplemental licensure, university endorsement programs, and alternative resident educator licenses.

In response to a request for applications from the Ohio Department of Higher Education, Ohio State University submitted a proposal and was awarded a grant of \$350,000. These funds, by state statute ORC 3333.129, are for funding student costs of attendance: e.g., course costs, materials and supplies, and exam fees. As such, the Ohio State University award is expected to fully support a cohort of 10 students through completion of the certificate, and provide 50% support to an additional cohort of 20 students.

V Competitiveness and Comparative Analysis

The Computer Science teaching endorsement is a state-based requirement, so the population of potential students—as well as the portfolio of competitive programs—is primarily contained to in-state students and in-state universities.

While the number of computer science endorsement programs in Ohio has grown in recent year, it is still insufficient to serve the over 700 public and private high schools in Ohio that do not have a computer science teacher. The size, ranking, quality, and reputation of Ohio State as the flagship university in the state gives this endorsement program a significant recruiting advantage over all the competitors.

In 2021, a coalition of industry and nonprofit partners prepared a report on the state of Computer Science Education in the nation. Appendix A is the relevant excerpt for Ohio.

As part of an agreement with EHE and the Department of Computer Science, OSO would market the proposed certificate. Typically, OSO works with the departments and colleges to create a strategic marketing plan, which includes additional marketing efforts carried out by EHE and the Department of Computer Science.

By taking one course per semester, teachers can complete the program in two academic years. However, it is also possible to take three courses in the summer, and thus complete

the endorsement in one calendar year. These completion times are comparable to other programs.



Memo

To: Randy Smith, Vice Provost for Academic Programs, Office of Academic Affairs
From: Rosie Quinzon-Bonello, Assistant Dean for Curriculum and Assessment
Date: November 4, 2025

Re: Informational Item: Computer Science Endorsement 5b Certificate.

The Department of Computer Science and Engineering informed the college Committee on Academic Affairs of its collaboration with the College of Education and Human Ecology Department of Educational Studies and the Department of Teaching and Learning to establish a Computer Science Endorsement 5b Certificate.

The College Committee on Academic Affairs was informed of this action during its November 4, 2025, meeting. There were no questions or concerns, and a college-level record of support for this proposal was created.

Yours sincerely,

Rosie Quinzon-Bonello

Appendix A: 2021 Report on State of Computer Science Education

2021 State of Computer Science Education

Nationally, just 51% of high schools offer computer science, up from 35% in 2018. This represents tremendous progress by teachers, school leaders, policymakers, and other advocates. But given the significance of computing in today's society, it is not enough for half of schools to lack even a single course. New data reveals disparities in who has access to and who participates in computer science education.

Over the past year, U.S. students, teachers, and families faced unprecedented challenges, making it more important than ever that computer science becomes a sustained part of the education system. Computer science supports the development of problem solving, creativity, metacognition, spatial skills, reasoning skills, and improvements in reading, writing, mathematics, and science test scores. Increasingly, computer science is recognized as a core literacy for students.

Students who attend rural schools, urban schools, or schools with higher percentages of economically disadvantaged students are less likely to have access to computer science.

States are working to broaden access and participation in computer science with policies to make computer science a fundamental part of the K-12 education system.

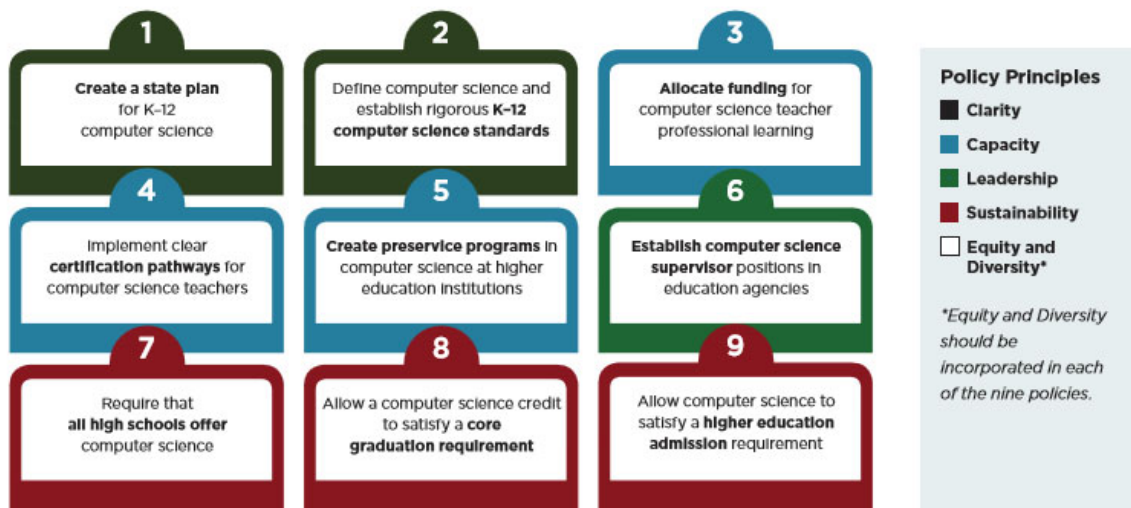
States that adopt **more of the nine policies** shown below have a greater percentage of high schools offering computer science.

Female students make up 49% of the elementary students enrolled in computer science, **44% of the middle school students**, and **only 31% of high school students**.

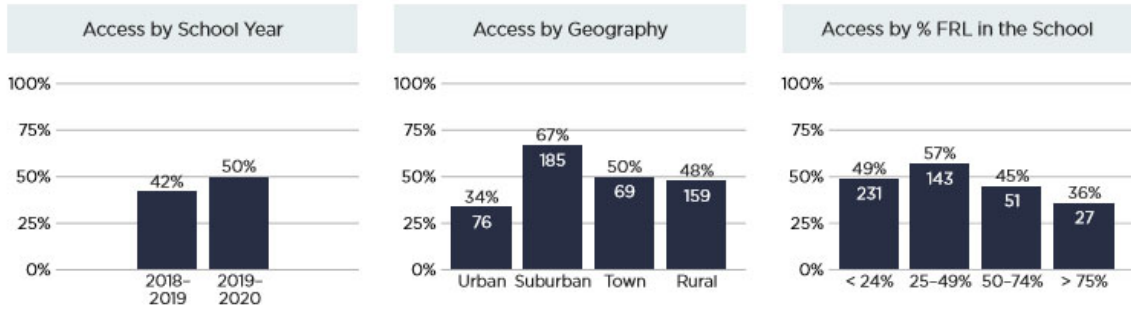
Although 78% of U.S. high school students attend a school that offers foundational computer science, **only 4.7% of students are enrolled in a course**.

Pursuing policies that expand access to K-12 computer science provides policymakers a rare opportunity to address equity, workforce, and education issues on a bipartisan basis.

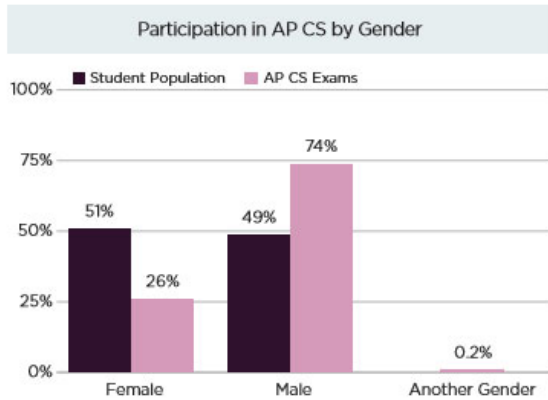
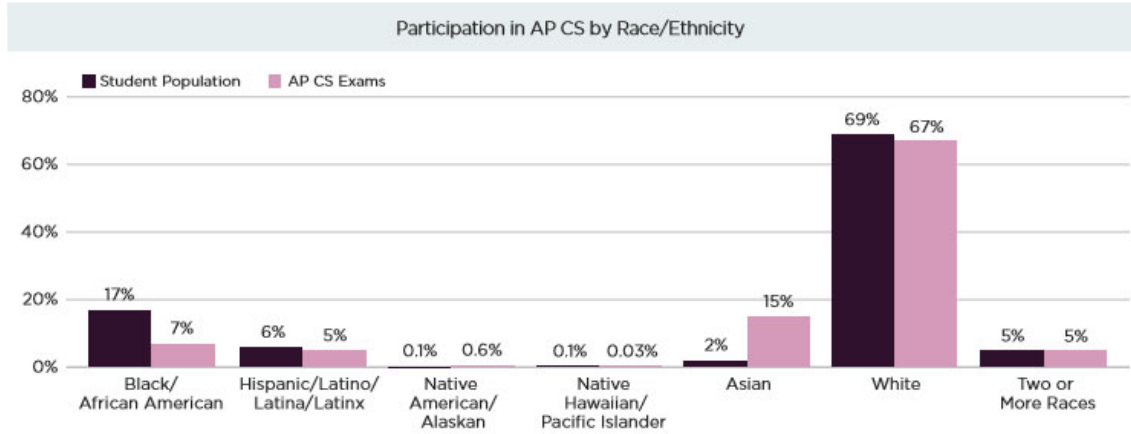
Nine Policies to Make Computer Science Fundamental



Percentage of Public High Schools Offering Foundational Computer Science



Participation in AP Computer Science by Demographic



65% of OH high school students attend a school that offers computer science. Of 3,548 total AP CS exams taken in Ohio last year, 26% were female and 0.2% identified as another gender. Black/African American students are 1.7 times less likely than their white and Asian peers to attend a school that offers AP CS. Only one Native Hawaiian/Pacific Islander student took an AP CS exam.

Access data provided primarily by the Department of Education and school catalogs, based on 971 schools with high school grades. Numbers inside the bars represent the total number of public high schools offering computer science in that category. Course enrollment data for all foundational computer science courses is not available from Ohio. State data on students identifying as another gender is also unavailable.

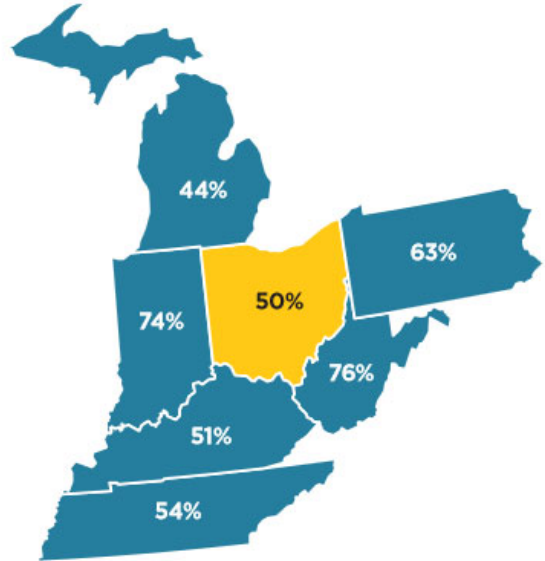


State policy should provide clarity, school and state capacity, leadership, sustainability of computer science initiatives, and promote access to and equity within rigorous and engaging computer science courses.

Regional Comparison of Computer Science Education Policy Adoption

POLICY	OH	IN	KY	MI	PA	WV	TN
State CS Plan	In progress	✓				✓	✓
K-12 CS Standards	✓	✓	✓	✓	✓	✓	✓
Funding for Teacher PD		\$12.6M	\$800K		\$56M	\$2.4M	\$518K
Teacher Certification	✓	✓	✓		✓	✓	✓
Preservice Programs	✓	✓			✓		✓
State CS Supervisor	✓	✓	✓	✓	✓	✓	✓
All High Schools Offer		✓				✓	
Graduation Credit	✓	✓	✓	✓	✓	✓	✓
Higher Ed Admission	✓	✓	✓				

Percent of High Schools Offering CS by Region



Ohio has averaged
18,628
open computing jobs each month

These open jobs have an average salary of
\$86,842

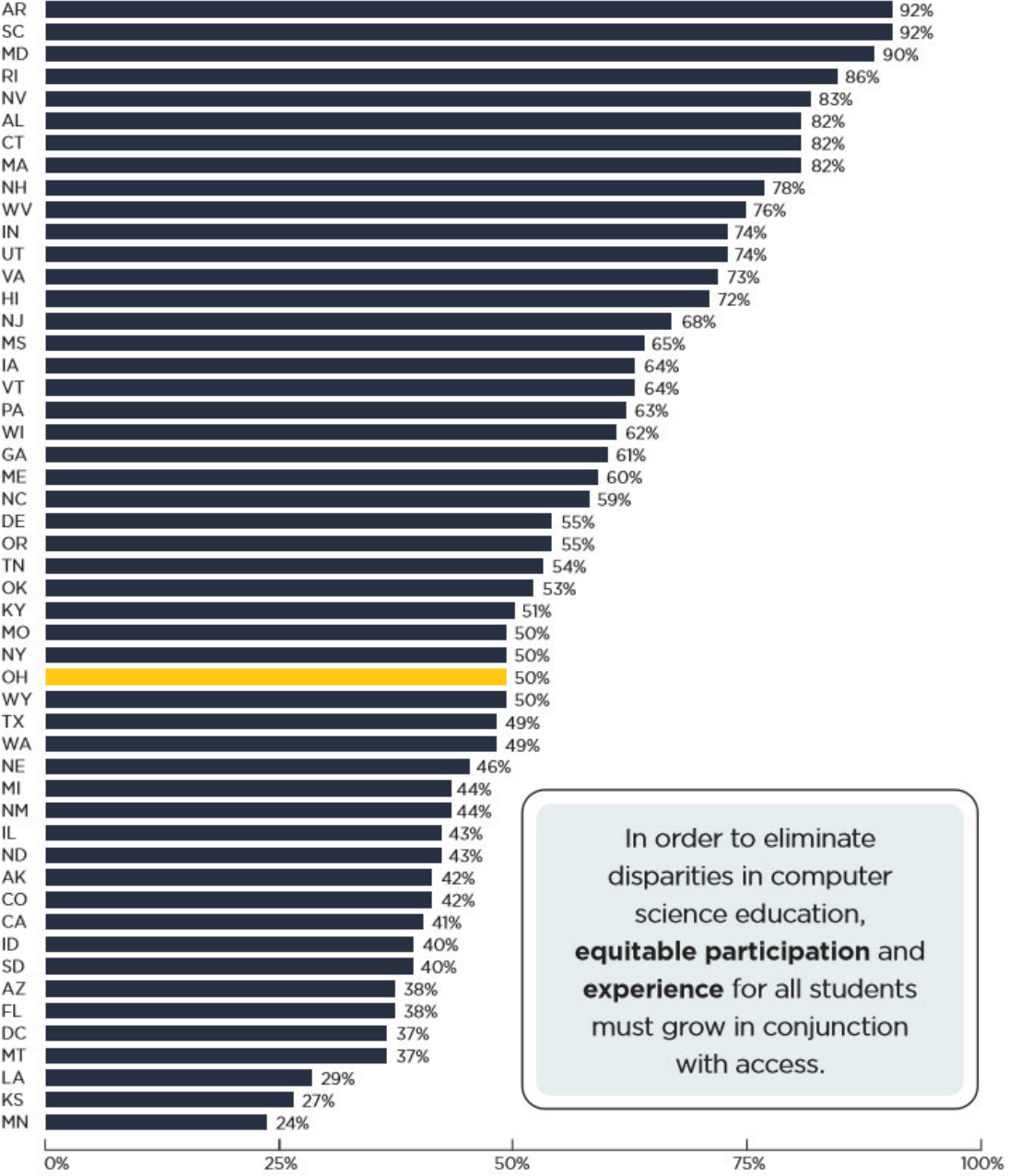
Yet there were only
1,584
graduates in computer science in 2018

Did you know... 65% of OH high school students attend a school that offers computer science.

Sources: The percent of high schools offering CS comes from the CS Access Report, open computing jobs come from the Conference Board, salaries come from the Bureau of Labor Statistics, and graduates come from the National Center for Education Statistics.



High Schools Offering Computer Science by State



In order to eliminate disparities in computer science education, **equitable participation** and **experience** for all students must grow in conjunction with access.

For more details on policy, access, and participation, see the full 2021 State of Computer Science Education report at advocacy.code.org/stateofcs



Memorandum of Understanding

Online Program

Between

**Computer Science Endorsement
Education and Human Ecology (Academic lead) and Engineering**
The Ohio State University

And

Ohio State Online
The Ohio State University

Purpose

The purpose of this Memorandum of Understanding (MOU) is to acknowledge that the **Computer Science Endorsement** has met or exceeded the modality substantive change threshold, making the program an online program or is a new online program for the university and will meet the requirements for an online program in partnership with Ohio State Online.

Term of MOU

This MOU will begin effective upon obtaining all necessary signatures and will remain in effect for the life of the program.

Services Provided for Program Launch

As an online program this program will receive Ohio State Online support, such as market research, student acquisition, ongoing student support, online program and course design and development, and state authorization and licensure research and disclosures (if applicable).

Based on pre-approval planning conversations, this program may leverage the following Ohio State Online services:

Online Enrollment Services: Generating and finding quality prospective students, selling prospective students on the program and Ohio State, helping re-enroll students each term to help them reach graduation, and supporting the college to recognize steady-state revenue streams.



Online Instruction Services: Reviewing and recommending evidence-based online program curricular design to best meet and support the intended audience and enrollment goals; providing and encouraging online instructor professional learning opportunities; and partnering with instructors for initial course design, development, and ongoing course updates.

It is expected Ohio State Online and program relationship contacts below will remain in discussions as part of ongoing college check-ins to evolve services to achieve program goals.

Table of Program Relationship Contacts

Units	College / Department / Campus	Ohio State Online
Organization Oversight	Don Pope-Davis, Dean	Jason Lemon, Dean
Administrative Oversight	- Bryan Warnick, Chair - Anastasia Snyder, Associate Dean	- Rob Griffiths, AVP, Online Learning and Innovation - Brandi Bittner, AVP, Online Enrollment
Program Oversight	Rick Voithofer, Professor	- Rob Griffiths, AVP, Online Learning and Innovation - Brandi Bittner, AVP, Online Enrollment
Course Oversight	Rick Voithofer, Professor	John Muir, OSO program / course design innovation, assigned Instructional Designer
Student Support Oversight	- Feng Qin, Assoc. Chair CSE - Michelle Pitro, Sr. Academic Prog Services, CSE	Assigned OSO Reenrollment Specialist
Marketing/Recruiting Oversight	- Stacey Dorr, Director of Strategic Marketing - Justin Grote, Director of	Assigned OSO Marketing Manager and Recruiting lead

	Recruitment and Enrollment	
Fiscal Oversight	Kelly Crawford, Chief Administration Officer	Jon Rucker, AVP, OSO Financial Strategy and Analysis

Signatories

By signing this MOU, all groups agree to be active partners and to abide by this agreement:

Program Director	<small>DocuSigned by:</small> <i>Richard J. Voithofer</i> <small>BE7C44D89C443...</small>	Date: 04/16/2025
Department Chair	<small>DocuSigned by:</small> <i>Bryan R. Warnick</i> <small>7C18B8C14A85420...</small>	Date: 04/16/2025
College Fiscal Officer	<small>DocuSigned by:</small> <i>Kelly Crawford</i> <small>F9C85B94AD84D479...</small>	Date: 04/21/2025
Curricular Associate Dean	<small>DocuSigned by:</small> <i>Tasha Snyder</i> <small>F7BF08BDA294436...</small>	Date: 04/23/2025
Dean	<small>DocuSigned by:</small> <i>Don Pope-Davis</i> <small>6BB2DCC36A88401...</small>	Date: 04/24/2025
Vice Provost and Dean of Online Learning	<small>DocuSigned by:</small> <i>Jason Edward Lemon</i> <small>9C19184E034F41C...</small>	Date: 04/24/2025



Online Program Attributes

Program Working Title: Computer Science Endorsement

Anticipated CAA approval date for ONL modality: SP25

Anticipated ODHE approval date for ONL modality: SP25

Program level:

Associate Undergraduate Graduate Professional

Approval type:

New program Change of delivery Certificate Stackable Other

If applicable, will the program continue to offer an on-ground version? Note, notification to CAA and Ohio State Online will be necessary if an approved program modality is no longer offered.

Yes No

Percentage of courses offered online for this program?

100% 80-99%

If other, please explain:

Anticipated term for first cohort:

Note, marketing and recruitment will begin approximately 6 months prior to first enrollment term.

Will this program have a different fee structure from what would normally be assessed to similar students at the university?

Note, submissions are due in December for Senate Fiscal review—[Financial Planning and Analysis and Student Fee Review Committee review is necessary for differentiated tuition](#). Once Senate Fiscal Committee recommendations are finalized, the request goes to the President and Provost for review and then for the official Board of Trustees approval.

Yes No

If yes, please explain justification:



Total credit hours for program: 15

Does this program have mandatory onsite training components? (e.g., practicum, residency, or internship)

Yes No

If yes, please explain:

Does this program have any non-mandatory onsite training components? (e.g., orientation)

Yes No

If yes, please explain:

Program Courses

The online program course delivery strategy at launch is outlined in the table below.

Note: the information in the first row of the table is included only to provide an example of how the information should be formatted.

Course Code and Name	Current Delivery Mode(s)* (how course has been offered previously: in person, hybrid, distance learning, N/A - new course)	Core or Elective	Asynchronous or Synchronous or Both	First Term and Session (if applicable) this Course will be Offered as part of this Online Program	Other terms and sessions (if applicable) this course be offered (None, AU25, SP25, SU25)
ESTL 5721	DL	Core	Asynchronous		
ESTec 5225	N/A	Core			
CSE 6011	IP (Pilot SP 25)	Pathway 1: Core	Sync in SU 25, then async after	SU 2025 (sync)	AU 25, SP26 as async
CSE 6012	IP	Pathway 1: Core Pathway 2: Core	Async	SU 2025	AU 25, SP 26?
CSE 6013	DL (Sync)	Pathway 1: Elective Pathway 2: Core	DL Synchronous	SU 2025	SU 2026
CSE 5471	DL (Sync)	Elective	DL Synchronous	AU 25	SP 26
TDA 5621	DL (Async)	Elective	DL Asynchronous	AU 25	

State Authorization / Disclosure

Ohio State Online will support necessary steps for approvals and notifications, and the program will abide by state laws and disclosure requirements, for items selected yes.

	Yes/No
Enroll students located outside Ohio?	No
Does this program potentially lead to a professional license or certification in any state?	Yes
Conduct on-ground supervised field experiences such as clinicals, practicums, student teaching or internships?	Yes



Certificate Of Completion

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Status: Completed

Subject: Complete with Docusign: Computer Science Endorsement OSO MOU

Source Envelope:

Document Pages: 7

Signatures: 6

Certificate Pages: 4

Initials: 0

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Columbus, OH 43210

rucker.78@osu.edu

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Richard J. Voithofer

voithofer.2@osu.edu

The Ohio State University

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Bryan R. Warnick

warnick.11@osu.edu

The Ohio State University

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(None)

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Bryan R. Warnick

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Electronic Record and Signature Disclosure:

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Kelly Crawford

robinsoncrawford.1@osu.edu

CAO

The Ohio State University

Security Level: Email, Account Authentication
(None)

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Kelly Crawford

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Electronic Record and Signature Disclosure:

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Anastasia Rebecca Snyder

snyder.893@osu.edu

The Ohio State University

Security Level: Email, Account Authentication
(None)

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Anastasia Snyder

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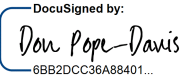
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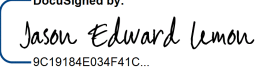
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Signer Events	Signature	Timestamp
<p>Don Pope-Davis pope-davis.1@osu.edu Dean The Ohio State University Security Level: Email, Account Authentication (None)</p>	<p>DocuSigned by:  6BB2DCC36A88401...</p> <p>Signature Adoption: Pre-selected Style Using IP Address: 74.129.184.172</p>	<p>Sent: 4/23/2025 3:12:10 PM Viewed: 4/24/2025 10:15:34 AM Signed: 4/24/2025 10:15:55 AM</p>

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<p>Jason Edward Lemon lemon.297@osu.edu Vice Provost and Dean The Ohio State University Security Level: Email, Account Authentication (None)</p>	<p>DocuSigned by:  9C19184E034F41C...</p> <p>Signature Adoption: Pre-selected Style Using IP Address: 128.146.234.102</p>	<p>Sent: 4/24/2025 10:15:57 AM Viewed: 4/24/2025 10:26:55 AM Signed: 4/24/2025 10:27:21 AM</p>
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<p>Detra M Price price.151@osu.edu Security Level: Email, Account Authentication (None)</p> <p>Electronic Record and Signature Disclosure: Not Offered via DocuSign</p>	<div style="border: 2px solid blue; padding: 5px; font-weight: bold; color: blue; font-size: 1.2em;">COPIED</div>	Sent: 4/24/2025 10:27:28 AM
<p>Emily Michele Hiatt hiatt.30@osu.edu Security Level: Email, Account Authentication (None)</p> <p>Electronic Record and Signature Disclosure: Not Offered via DocuSign</p>	<div style="border: 2px solid blue; padding: 5px; font-weight: bold; color: blue; font-size: 1.2em;">COPIED</div>	Sent: 4/24/2025 10:27:29 AM
<p>Kathryn Marie Reed reed.901@osu.edu The Ohio State University Security Level: Email, Account Authentication (None)</p> <p>Electronic Record and Signature Disclosure: Not Offered via DocuSign</p>	<div style="border: 2px solid blue; padding: 5px; font-weight: bold; color: blue; font-size: 1.2em;">COPIED</div>	Sent: 4/24/2025 10:27:30 AM
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<p>Rajiv Ramnath ramnath.6@osu.edu Professor of Practice The Ohio State University Security Level: Email, Account Authentication (None)</p> <p>Electronic Record and Signature Disclosure: Not Offered via DocuSign</p>	COPIED	Sent: 4/24/2025 10:27:34 AM
<p>David Lane Tomasko tomasko.1@osu.edu Associate Dean, Engineering The Ohio State University Security Level: Email, Account Authentication (None)</p> <p>Electronic Record and Signature Disclosure: Not Offered via DocuSign</p>	COPIED	Sent: 4/24/2025 10:27:35 AM
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<p>Nicole Beth Herbert herbert.1865@osu.edu Interim Director Security Level: Email, Account Authentication (None)</p> <p>Electronic Record and Signature Disclosure: Not Offered via DocuSign</p>	COPIED	Sent: 4/24/2025 10:27:38 AM

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