

# Alabama Commission on Higher Education

## 2025 Alabama Numeracy Act Report as required by Alabama Act #2022-249



## Alabama Commission on Higher Education

December 30, 2025

The Honorable Kay Ivey Governor of Alabama  
State Capitol  
600 Dexter Avenue  
Montgomery, Alabama 36130

Dear Governor Ivey:

On behalf of the Alabama Commission on Higher Education, I am pleased to submit the Alabama Numeracy Act Report for 2025, as required under the provisions of the Alabama Act #2022-249. This report provides an overview of the progress made toward improving mathematics education and numeracy outcomes across the state, highlighting various focus areas, such as the following:

- Changes to curriculum for elementary and early childhood teacher candidates,
- Implementation timelines for Alabama's educator preparation providers, and
- Updates on the Foundations of Mathematics Assessment for new teachers.

We appreciate your sustained leadership and commitment to advancing excellence in mathematics education for Alabama's students, the future leaders of our state. Please do not hesitate to contact me if you have questions or require additional information.

Sincerely,

A handwritten signature in black ink, appearing to read "Jim Purcell".

Dr. Jim Purcell  
Executive Director

cc:

Lieutenant Governor Will Ainsworth  
Representative Nathaniel Ledbetter, Speaker of the House  
Senator Garlan Gudger, President Pro Tempore of the Senate  
Representative Danny Garrett, Chair of the House Ways and Means Education Committee  
Representative Terri Collins, Chair of the House Education Policy Committee  
Senator Arthur Orr, Chair of the Senate Finance and Taxation Education Committee  
Senator Donnie Chesteen, Chair of the Senate Education Policy Committee  
Representative Anthony Daniels, Minority Leader of the House of Representatives  
Senator Bobby Singleton, Minority Leader of the Senate  
Director Othni Lathram, Legislative Services Agency  
Director Bill Poole, Alabama Department of Finance

The following report is submitted in fulfillment of Section 13(c) of the Alabama Numeracy Act of 2022, which reads as follows:

“No later than December 31, annually, the Alabama Commission on Higher Education shall submit to the Governor, the Lieutenant Governor, the Speaker of the House of Representatives, the President Pro Tempore of the Senate, the Chair of the House Ways and Means Education Committee, the Chair of the Senate Finance and Taxation Education Committee, the Chair of the House Education Policy Committee, the Chair of the Senate Education Policy Committee, the Minority Leader of the House of Representatives, and the Minority Leader of the Senate a report on the status of the implementation and adoption of the mathematics education guidelines for postsecondary institutions, the number of subject matter college level semester hours earned, the status of partnerships between educator preparation faculty and mathematics faculty, and the percentage of passing scores on State Board of Education approved assessments for candidates seeking educator certification in mathematics at any grade level, as well as the mathematics section on State Board of Education approved assessments for those seeking certification in early childhood or elementary education. The report shall be conspicuously published on the website of the department.”

Alabama Act #2022-249, Section 13(c)  
*Code of Alabama, §16-6H-13(c)*

# **2025 Annual Report on the Implementation of the Alabama Numeracy Act by Educator Preparation Providers**

As required by Section 13(c) of the Alabama Numeracy Act (*Code of Alabama, §16-6H-13[c]*), the Alabama Commission on Higher Education (ACHE) has conducted an annual review for 2025 detailing the progress of Alabama's postsecondary teacher preparation providers in implementing the Act's requirements. This report has been developed with the collaboration of the Office of Mathematics Improvement within the Alabama State Department of Education (ALSDE) and with the full cooperation of Alabama's 24 approved postsecondary teacher preparation institutions, referred to throughout the report as Educator Preparation Providers (EPPs).

## **Evaluation of Numeracy Coursework for Compliance with ANA Requirements**

The Alabama Numeracy Act (ANA) tasked the Postsecondary Mathematics Task Force with providing guidance to EPPs for improving teacher education curricula in line with research and best practices in mathematics education at the early childhood (P-3) and elementary (K-6) levels. Over the course of 2025, the Task Force has met six times, with the primary goal of establishing and carrying out a process for reviewing proposed course sequences to determine whether they meet ANA requirements. With the administrative support of the Office of Mathematics Improvement, the Task Force has delegated the course sequence reviews to a smaller committee of experts, known as the ANA Course Review Committee, comprised of five to seven EPP faculty members who specialize in mathematics pedagogy in early childhood, elementary, and special education contexts. The ANA Course Review Committee has convened 17 times during 2025 to review proposed sequences.

Based on initial reviews of proposed numeracy course syllabi, the ANA Course Review Committee developed rubrics to provide further guidance to EPPs and ensure consistency in their evaluations. Last updated in May 2025, the undergraduate and graduate "Rubrics for the Evaluation of Alabama Numeracy Act Coursework" focus on the following eight criteria (see Appendices A and B):

1. Course Content Alignment with Standards and Research
2. Depth and Breadth of Mathematical Content
3. Integration of Mathematical Practices and Processes
4. Attention to Student Thinking and Common Misconceptions
5. Fieldwork and Clinical Experiences
6. Key Assignments and Assessments
7. Course Readings and Resources
8. Attention to Meeting the Needs of Learners Who Have Challenges in Learning Mathematics

In evaluating syllabi for courses of proposed sequences, the ANA Course Sequence Review Committee scores the sequence on each criterion using four-point scale, with four (4) as

“exemplary,” three (3) as “proficient,” two (2) as “approaching,” and one (1) as “needs improvement,” for a total of 32 possible points. To be approved by the Committee, a sequence must score at least 24 points, where a total score of 29-32 points is considered “exemplary” and 24-28 points is considered “proficient.” Proposed sequences that score 23 points or below are returned to the EPP with specific recommendations for improvement. An EPP can then resubmit the sequence once the Committee’s feedback has been addressed.

### **Technical Assistance for Numeracy Coursework Development**

Throughout 2025, several opportunities for technical assistance were available to support EPPs in developing new numeracy coursework or redesigning existing coursework to meet requirements. In June, the Office of Mathematics Improvement provided a weeklong sample course that focused on the mathematical concepts of patterns, functions, and algebraic reasoning integrated with pedagogical approaches designed for P-6 learners. Approximately 20 faculty members took advantage of this professional development opportunity.

Additionally, faculty leaders provided collaborative guidance to colleagues across the state. Dr. Megan Burton, Professor of Elementary Education at Auburn University, hosted monthly online sessions in July, August, and September for EPP faculty to collaborate regarding course development and implementation. Dr. Angela Barlow, Professor and Dean of Education at the University of South Alabama (USA), organized and hosted two professional development sessions for colleagues across the state, and she has offered to share USA’s approved course sequence with other EPPs for adoption, along with a collaboration agreement (currently in development) to support ongoing partnership throughout the implementation period. These and other collaborative efforts by Alabama’s EPP faculty were highlighted in the Fall 2025 article, “Navigating the Alabama Numeracy Act Together: Collaborative Efforts Support Mathematics Teacher Educators to Improve Elementary Teacher Preparation,” published in the peer-reviewed journal *Connections*, a national publication of the Association of Mathematics Teacher Educators (see Appendix C).

### **Scope and Timeline of EPP Curricular Changes**

The 2024 “Guidelines for the Mathematical Preparation of Teachers” require that EPPs revise the curricula for their initial educator certification pathways in Elementary Education (K-6), Early Childhood Education (P-3), Collaborative Special Education (K-6), and Early Childhood Special Education (P-3) to integrate mathematics content and pedagogy. Across all 24 EPPs, a total of 85 separate baccalaureate and alternative master’s programs fall into one or more of these categories. A complete list of teacher education programs required to have ANA sequences approved is provided in Appendix D of this report. As specified in the regulations governing educator preparation (*Alabama Admin. Code §290-3-3-07*), the deadline for implementing new numeracy curricula is August 2026.

As of December 15, 2025, the ANA Course Sequence Review Committee has approved numeracy course sequences for the following twenty-one (21) programs, as shown in Table 1.

**Table 1**

*List of Educator Preparation Programs with Numeracy Course Sequences Approved in 2025  
(Green shading indicates that an institution has had all applicable programs approved.)*

University	Deg Type	Classification of Instructional Program (CIP) Title	ANA Sequence Approval Date
Auburn Univ	Baccalaureate	Special Education and Teaching, Other	5/22/2025
Auburn Univ	Baccalaureate	Elementary Education and Teaching	4/22/2025
Auburn Univ	Baccalaureate	Early Childhood Education and Teaching	7/23/2025
Auburn Univ	Master's--Alt A	Special Education and Teaching, Other	5/22/2025
Faulkner Univ	Baccalaureate	Elementary Education and Teaching	8/21/2025
Univ of Alabama	Baccalaureate	Elementary Education and Teaching	4/29/2025
UAB	Baccalaureate	Elementary Education and Teaching	6/18/2025
UAB	Baccalaureate	Early Childhood Education and Teaching	6/18/2025
UAH	Baccalaureate	Education/Teaching of Individuals in Early Childhood Special Education Programs	7/17/2025
UAH	Baccalaureate	Elementary Education and Teaching	7/17/2025
UAH	Master's--Alt A	Elementary Education and Teaching	7/17/2025
UAH	Master's--Alt A	Teacher Education, Multiple Levels (Special Ed)	7/17/2025
Univ of Mobile	Baccalaureate	Education/Teaching of Individuals in Elementary Special Education Programs	12/3/2025
Univ of Mobile	Baccalaureate	Elementary Education and Teaching	12/3/2025
Univ of Mobile	Baccalaureate	Early Childhood Education and Teaching	12/3/2025
Univ of Mobile	Master's--Alt A	Elementary Education and Teaching	12/15/2025
Univ of Mobile	Master's--Alt A	Early Childhood Education and Teaching	12/15/2025
Univ of South AL	Baccalaureate	Special Education and Teaching, General	10/7/2025
Univ of South AL	Baccalaureate	Elementary Education and Teaching	10/7/2025
Univ of South AL	Master's--Alt A	Elementary Education and Teaching	12/3/2025
Univ of South AL	Master's--Alt A	Early Childhood Education and Teaching	12/3/2025

Seven of the 24 EPPs have had one or more numeracy course sequences approved. Three universities (Auburn University, University of Alabama in Huntsville, and the University of Mobile) have received approval for course sequences across all existing teacher education programs in numeracy-related teaching fields, which are shaded in green in the table above. Another two institutions have had two or more course sequences approved (University of Alabama at Birmingham and University of South Alabama). The approvals to date represent approximately 25% of the total programs that must have numeracy course sequences approved. EPPs have been advised by the Postsecondary Mathematics Task Force that syllabi for the outstanding numeracy course sequences must be submitted by March 31, 2026, so that the ANA Course Review Committee can complete its evaluations by July 2026.

The following table (Table 2) put together by the Office of Mathematics Improvement sets forth the implementation deadlines for EPPs to begin delivering their approved numeracy course sequences, though many EPPs are on track to begin delivering approved courses in Fall 2026.

**Table 2***Deadlines Given by OMI for EPPs to Begin Delivering Approved Numeracy Coursework**\*FOMA: Foundations of Mathematics Assessment*

	<b>Spring 2026</b>	<b>Fall 2026</b>	<b>Spring 2027</b>	<b>Fall 2027</b>	<b>Spring 2028</b>	<b>Fall 2028</b>	<b>Spring 2029</b>
<b>2025-2026 Freshmen</b>	<b>Courses Approved</b>						
<b>2026-2027 Sophomores</b>			<b>Course 1</b>				
<b>2027-2028 Juniors</b>				<b>Course 2</b>	<b>Course 3</b>		
<b>2028-2029 Seniors</b>						<b>Course 4 Take FOMA*</b>	<b>Pass FOMA</b>

**Number of Subject-Matter College-Level Semester Hours to be Earned**

Once a program's numeracy course sequence has been approved, the EPP can revise its program checklist, which lists all the courses that teacher candidates must complete, including professional studies courses and teaching field courses, along with coursework designed to fulfill the requirements of the Alabama Numeracy Act and the Alabama Literacy Act. Each new program checklist must be approved by the Alabama State Board of Education (State Board) before graduates can be eligible for initial educator certification in one or more of the Numeracy Act-applicable teaching fields: Elementary Education (K-6), Early Childhood Education (P-3), Collaborative Special Education (K-6), or Early Childhood Special Education (P-3).

In March 2025, the State Board unanimously adopted new regulations governing program checklists for approved Educator Preparation Providers (Alabama Admin. Code §290-3-3). For programs leading to Class B Certificates in Numeracy Act-applicable fields, the new regulations eliminated the so-called “4x12” course requirements, which dictated that Elementary Education, Early Childhood Education, and Collaborative Special Education K-6 teacher candidates had to complete 12 semester credit hours in each of four general education subject areas (Mathematics, Sciences, English, and Social Sciences). With this 4x12 requirement gone, EPPs now have more flexibility to incorporate approved numeracy coursework without raising the total number of semester credit hours required for the degree. Keeping the total credit hours lower enables teacher candidates to complete their studies sooner and enter the classroom sooner.

The following table (Table 3) lists the program checklist requirements for teacher candidates in undergraduate programs that lead to Class B Certification in Numeracy Act-applicable fields as noted in *Alabama Administrative Code §290-3-3-01 et seq.*

**Table 3**

*Course Requirements for Undergraduate Programs leading to Class B Certification in Elementary Education K-6, Early Childhood Education P-3, Collaborative Special Education K-6, or Early Childhood Special Education P-3*

<b>General Studies Courses</b>	Minimum of 41 hours lower-division coursework
<b>Professional Studies Courses</b>	Taken by all education majors, no minimum hours set
Special Education Course*	3 credit hours in teaching field or prof studies
Classroom Management*	3 credit hours in teaching field or prof studies, unless embedded
Field Experiences—General	No minimum hours set
Teacher Internship*	Minimum 9 credit hours in teaching field or prof studies
<b>Teaching Field Courses</b>	Minimum of 30 hours, 18 hours upper division
Science of Reading Courses	9 credit hours
Numeracy Act Courses	12 credit hours
Other Methods Course(s)	No minimum hours set
Special Education Course*	3 credit hours in teaching field or prof studies
Classroom Management*	3 credit hours in teaching field or prof studies, unless embedded
Field Experiences—In Field	Must fulfill accreditation requirements
Teacher Internship*	Minimum 9 credit hours in teaching field or prof studies
<b>Total Credit Hours</b>	<b>Minimum of 120 semester credit hours</b>

\* Indicates requirement can be included in professional studies courses or teaching field courses at the discretion of the EPP.

The new regulations also included minor updates for master's programs leading to initial educator certification, known as Alternative Class A or Alt-A programs. Aspiring teachers on the Alt-A pathway have already earned bachelor's degrees in non-teaching fields. Program coursework is a combination of the teaching field requirements for the traditional master's degree leading to Class A certification and the initial educator certification requirements, including the science of reading coursework, numeracy coursework, professional studies courses, and fieldwork/internship experiences.

### **Status of Partnerships Between Educator Preparation Faculty and Mathematics Faculty**

In their Fall 2025 *Connections* article on “Navigating the Alabama Numeracy Act Together,” Barlow *et al.* summarize the impact of the ANA legislation on the mathematics requirements for aspiring early childhood and elementary educators (text formatting preserved from original):

“The ANA requires significant changes for candidates seeking certification in areas that include the teaching of K–5 mathematics. With OMI spearheading the improvement efforts, it

is now a requirement that *all K–5 mathematics teacher candidates (including early childhood, elementary, and special education) complete 12 credit hours of integrated mathematics content and pedagogy courses, with nine of those credit hours being at the junior/senior level*. Although OMI provided guidance on the learning outcomes for mathematics content and pedagogy and related field experiences, it has been at the discretion of individual institutions of higher education to reimagine and design their programs. Importantly, the guidance focuses on the development of courses that integrate content and pedagogy, regardless of the department in which the courses are taught. This was and continues to be a substantial pivot for most of the state's institutions. Prior to the ANA, education departments typically offered 1–2 mathematics methods courses during the junior/senior years, with mathematics departments offering several mathematics content courses (some specifically for elementary teachers)."

The elimination of the 4x12 requirement for undergraduate Elementary, Early Childhood, and Collaborative Special Education programs has meant that aspiring P-6 teachers need to complete only one lower-division mathematics course to fulfill the statewide general education requirement for Area III (Mathematics and Sciences), along with the approved numeracy course sequence associated with their major. As the new program checklists are implemented, fewer education majors will enroll in lower-division mathematics coursework that is not included within the numeracy sequence.

Nonetheless, EPPs have the discretion to partner with the mathematics departments at their institutions to develop courses for the undergraduate numeracy course sequences. Two of the institutions with approved numeracy sequences have included a course delivered by the mathematics department, which are as follows:

- Auburn University, MATH 2850: Mathematics for Elementary Educators I
- University of Alabama, MATH 208: Number and Operations

As additional course sequences are approved, other EPPs may opt to offer one numeracy course in partnership with their mathematics colleagues.

### **Status of Alabama Transfers Pathways into Elementary and Early Childhood Education**

To better understand the scope of undergraduate transfer in Numeracy Act-applicable fields, the Alabama Commission on Higher Education analyzed enrollment and completion data within the statewide student database, which includes records for public two-year and four-year institutions, along with a handful of private Alabama institutions who have opted in for data collection. The analysis conducted in April 2025 linked first-time full-time students who started at an Alabama Community College System (ACCS) institution within the last five academic years and subsequently enrolled at a four-year institution and mapped their transfer pathway according to the major they enrolled in at the four-year institution. Table 4 shows the top ten transfer pathways, by disciplinary area (referred to below as 2-digit CIP).

**Table 4**

*Top Ten Two-year to Four-year Transfer Pathways for Alabama Institutions (ordered by number of students enrolled in the pathway) based on April 2025 analysis of ACHE data*

AVG/YR	5YR TOTAL	Transfer Pathway by 2-digit CIP
522.6	2613	<b>Business, Management, Marketing, and Related</b>
259.2	1296	<b>Health Professions And Related Programs</b>
<b>200.8</b>	<b>1004</b>	<b>Education, Teaching Numeracy</b>
180.8	904	<b>Engineering</b>
156	780	<b>Education, All Other</b>
150.8	754	<b>Biological And Biomedical Sciences</b>
129.4	647	<b>Psychology</b>
100.2	501	<b>Computer and Information Sciences</b>
84.6	423	<b>Visual And Performing Arts</b>
72.8	364	<b>Undeclared</b>

Importantly, the analysis separated those students in the Numeracy Act-applicable pathways (Elementary Education, Early Childhood Education, Collaborative Special Education) from all other Education pathways (e.g., Secondary Education, Physical Education). Within the five-year period of analysis (data from Fall 2019 to Spring 2024), 1004 students began at a two-year institution and subsequently enrolled in a four-year institution within a Numeracy Act-applicable major. On average, more than 200 students pursue this pathway per year. The “Education, Teaching Numeracy” pathway emerged as the third most common transfer pathway, after Business and Health Professions. All other Education majors came in fifth, after Engineering.

The elimination of the 4x12 requirement for undergraduate Elementary, Early Childhood, and Collaborative Special Education programs impacts the Alabama Transfers pathways for these ~200 students each year who seek to complete their freshman and sophomore years at one of Alabama’s community colleges. Under the previous 4x12 rule, an aspiring teacher who started at a community college could complete a full 60 semester hours to earn an associate degree and apply all credit toward the lower-division course requirements needed for their major. The new regulations have eliminated as much as 12 semester hours of lower-division course requirements, in many cases replacing these with new numeracy courses to be offered at the upper-division (junior/senior) level. Although the total credit hours required for graduation have largely remained unchanged, the shift toward fewer lower-division courses and more upper-division coursework has made it more challenging to establish 2+2 transfer pathways in majors affected by the Numeracy Act. Without clarity in degree requirements for these majors, community colleges struggle to advise students on the appropriate coursework to take at the associate level that will also count toward their desired major at the baccalaureate level. Additional challenges have arisen with scheduling and staffing lower-division mathematics courses, since aspiring Elementary, Early Childhood, and Collaborative Special Education majors no longer need to complete 12 semester hours of math courses.

In April 2025 and again in September 2025, ALSDE, ACCS, and ACHE held daylong workshops for two-year and four-year faculty members to consider options for expanding lower-division coursework eligible for transfer. These sessions focused on identifying three or four lower-division courses in Psychology, Child Development, or related disciplines that are currently offered at ACCS institutions and could be modified to fulfill Professional Studies requirements for students transferring into Education fields at many four-year institutions. The sessions were broadly attended and resulted in concrete plans to update course frameworks for the following courses to promote transfer:

- PSY 210: Human Growth and Development
- PSY 240: Educational Psychology
- CHD 201: Child Growth and Development Principles
- CHD 210: Educating Exceptional Children

In addition, the 2024 “Guidelines” include a provision that numeracy course sequences may include one lower-division course, which provides some additional possibilities for supporting transfer between two-year and four-year institutions. Encouragingly, the approved numeracy course sequences for the following institutions take advantage of the option to include a lower-division course:

- Auburn University, MATH 2850: Mathematics for Elementary Educators I
- University of Alabama, MATH 208: Number and Operations
- University of Alabama in Huntsville, ED 240: Teaching and Learning Mathematics through Problem Solving
- University of South Alabama, EDU 234: What It Means to Know and Do Mathematics
- University of Mobile, TE 212: Foundations of Numbers & Operations
- Faulkner University, ED 2305: Math Methods I

Several of these courses offer promising transfer possibilities. In particular, the math department courses developed by Auburn and the University of Alabama may most closely align with current ACCS offerings and require some modification to support transfer. Lower-division courses offered with Education prefixes will require more effort to develop an equivalent ACCS course and staff it with the appropriately credentialed faculty. Nonetheless, the willingness of four-year institutions, notably the University of South Alabama, to share course syllabi and offer technical assistance with curriculum development may speed up the process for ACCS institutions to make such a course available.

### **Percentage of Passing Scores on State Board-Approved Assessments for Candidates Seeking Certification in Mathematics at Any Grade Level**

All individuals seeking initial educator certification must complete the Alabama Educator Certification Assessment Program (AECAP) as a prerequisite for certification. Under the current AECAP requirements, teacher candidates must achieve a passing score on the appropriate Praxis Content Test(s), which are developed and administered by the Educational Testing Service (ETS). The most recent Statewide Report Card for EPPs provides 2024 data on Praxis

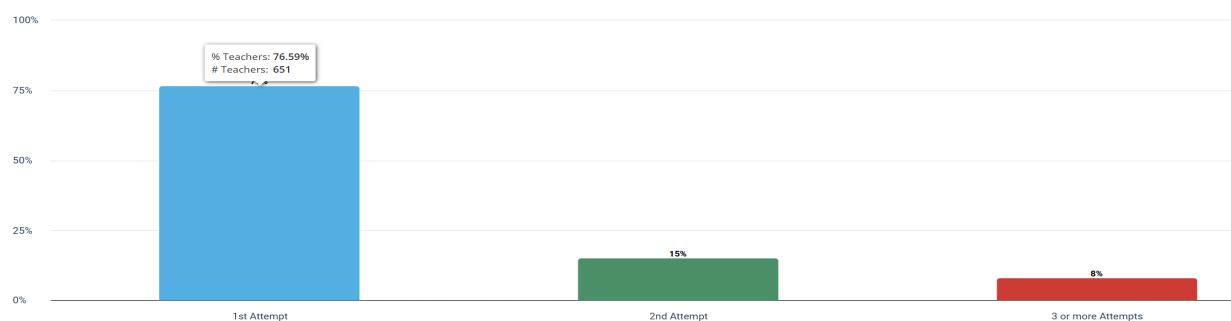
pass rates on two mathematics assessments: Multiple Subjects: Mathematics, which is required for Elementary, Early Childhood, and Collaborative Special Education certification; and Secondary Mathematics. The Alabama State Department of Education has recently published an interactive EPP Report Card that provides more information on teacher candidates who passed each assessment, as detailed in Figures 1-5.

**Figure 1**

*Aggregated State-Level Data for Bachelor's-Level Teacher Candidates Passing the Multiple Subjects: Mathematics Praxis in 2023-24, n=850*

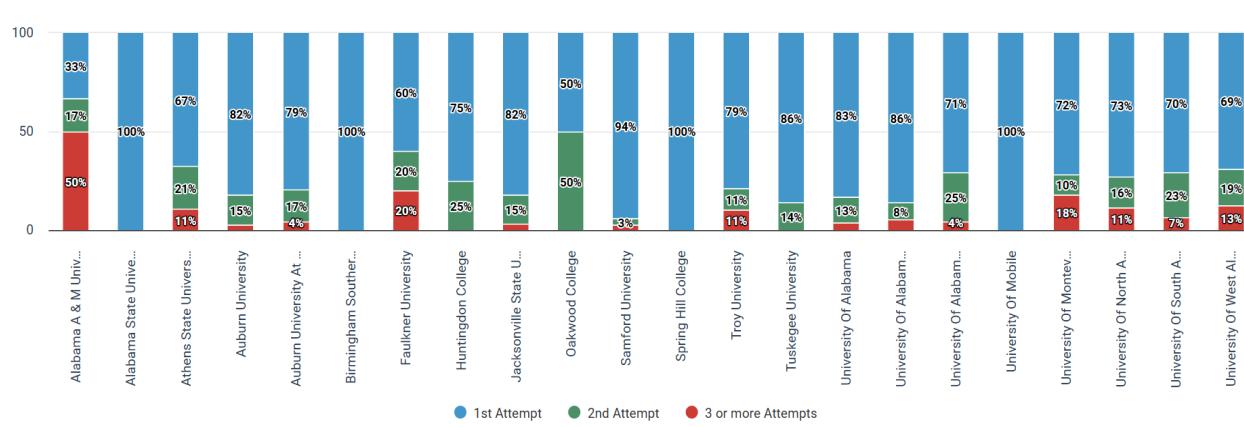
State-Level: Content Exam Pass Rate for Certificates Issued in 2023-2024

Note: \*\* designates that data are not reported because the N is 5 or less.



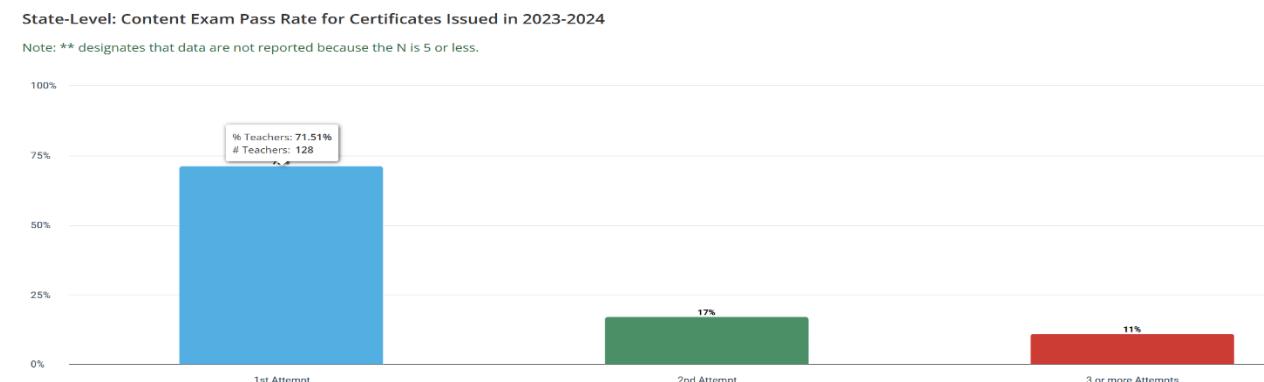
**Figure 2**

*Data for Bachelor's-Level Teacher Candidates Passing the Multiple Subjects: Mathematics Praxis in 2023-24, Disaggregated by EPP, n=850*



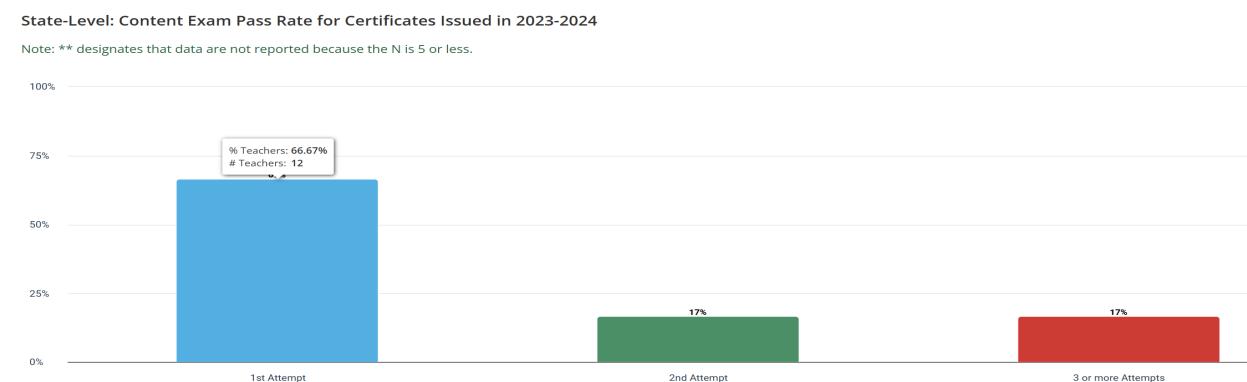
**Figure 3**

*Aggregated State-Level Data for Graduate-Level (Alt-A) Teacher Candidates Passing the Multiple Subjects: Mathematics Praxis in 2023-24, n=179*



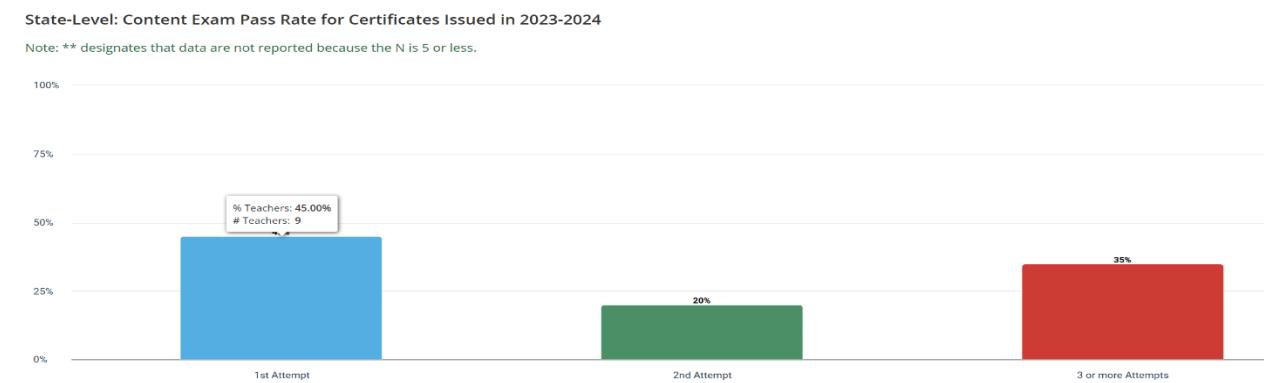
**Figure 4**

*Aggregated State-Level Data for Bachelor's-Level Teacher Candidates Passing the Secondary Mathematics Praxis in 2023-24, n=18*



**Figure 5**

*Aggregated State-Level Data for Graduate-Level (Alt-A) Teacher Candidates Passing the Secondary Mathematics Praxis in 2023-24, n=20*



The Report Card data indicate that across all the pathways, a total of 1,067 individuals earned passing scores on the required Praxis subtests in mathematics. Of these 800 candidates (75%) passed on their first attempt. It is important to note that the current State Board-approved assessments test candidates only on mathematical content knowledge and do not evaluate pedagogy.

### **Percentage of Passing Scores on State Board-Approved Assessments for Candidates Seeking Certification in Early Childhood or Elementary Education**

The Alabama Numeracy Act prescribes that ALSDE adopt a new assessment to determine whether prospective early childhood and elementary educators possess the requisite knowledge of K-5 mathematics content and pedagogy. Following an extensive Request for Proposals (RFP) and vendor selection process, the ALSDE has selected the Educational Testing Service (ETS) to develop and deliver the Foundations of Mathematics Assessment. With the vendor identified, the Office of Mathematics Improvement has advised EPPs that the Foundations of Mathematics Assessment will become consequential for teacher candidates graduating in 2029 and thereafter. Candidates graduating in 2027 and 2028 will engage with pilot versions of the assessment, while the Praxis Multiple Subjects: Mathematics will still serve as the state board-approved assessment for certification in Elementary Education, Early Childhood Education, and Collaborative Special Education.

### **Conclusion**

This year's report finds that EPPs are actively working to ensure compliance with the Alabama Numeracy Act by developing instructional frameworks that prepare elementary and early childhood teacher candidates with the mathematics content knowledge and pedagogical skills needed to improve student outcomes. All 24 EPPs are fully engaged in redesigning undergraduate and graduate curricula to meet the Act's requirements by Fall 2026. As campuses transition to this revised approach to educator preparation, substantial coordination will be required to manage impacts beyond colleges of education, including reduced demand for mathematics department courses and constraints on community college transfer pathways. The December 2026 report will provide additional insight into next steps in the implementation process, while documenting accomplishments and identifying emerging challenges.

## Appendix A

### Rubric for Evaluating Alabama Numeracy Act Coursework (Revised May 2025)

Criteria	Exemplary (4)	Proficient (3)	Approaching (2)	Needs Improvement (1)
<b>1. Course Content Alignment with Standards and Research (12 semester hours)</b>	Syllabi clearly articulate how <b>each course's content</b> aligns with state standards and research-informed recommendations on elementary teachers' mathematics education. Each syllabus provides evidence of how the course <i>integrates</i> content and pedagogy, addressing both what teachers need to know and how to teach it effectively.	Syllabi align with state standards and incorporate major recommendations from research on elementary teachers' mathematics education. Evidence of the <i>inclusion</i> of both content and pedagogy is provided in each course.	Syllabi partially address state standards and/or may lack specific connections to research on elementary teachers' mathematics education. Limited evidence of the inclusion of both content and pedagogy is provided.	Syllabi demonstrate weak or inconsistent alignment with state standards and research on elementary mathematics education. The inclusion of both content and pedagogy is unclear or absent.
<b>2. Depth and Breadth of Mathematical Content (12 semester hours)</b>	The syllabi outline a comprehensive and in-depth exploration of ALCOS mathematics content across K-5 grades with approximately 25% of coursework devoted to each of the following areas: <ul style="list-style-type: none"> <li>• K-2 content in the ALCOS focused on <u>Foundations of Counting</u> and <u>Operations with Numbers: Base Ten</u></li> <li>• 3-5 content from the ALCOS focused on <u>Operations with Numbers: Base Ten</u> and <u>Operations with Numbers: Fractions</u></li> <li>• ALCOS on <u>Operations and Algebraic thinking</u></li> <li>• <u>Geometry, Measurement and Data Analysis</u></li> </ul> Courses emphasize conceptual understanding and connections across topics.	The syllabi include the K-5 content areas but may not explore all topics with suggested proportional emphasis. Courses emphasize conceptual understanding for all topics.	Syllabi include most of the K-5 content areas but may lack evidence of teaching for conceptual understanding.	Syllabi omit significant content areas or focus predominantly on procedural skills without addressing underlying concepts.
<b>3. Integration of Mathematical Practices and Processes (12 semester hours)</b>	The syllabi explicitly integrate Student Mathematical Practices (SMPs) and Mathematical Teaching Practices (MTPs) <b>throughout the courses</b> . They include extensive opportunities for teacher candidates to engage in these practices as learners	Syllabi provide evidence of integration of SMPs and MTPs throughout the courses, and some course activities from each course provide opportunities for teacher candidates	Syllabi provide evidence of limited integration of SMPs and MTPs.	Syllabi do not meaningfully address SMPs and MTPs.

	and analyze them from a teaching perspective.	to engage in these practices.		
<b>4. Attention to Student Thinking and Common Misconceptions (connected to a minimum of 6 semester hours of coursework)</b>	Syllabi provide evidence of significant attention to analyzing student thinking including learning trajectories and common misconceptions and error patterns. They include readings and assignments that require students to examine student work samples and develop strategies for addressing misconceptions.	Syllabi provide adequate evidence of attention to understanding student thinking and address common misconceptions.	Syllabi provide limited evidence of attention to understanding student thinking and addressing common misconceptions.	Syllabi do not meaningfully address student thinking or common misconceptions.
<b>5. Fieldwork and Clinical Experiences (connected to a minimum of 6 semester hours of coursework)</b>	Syllabi outline a variety of rich, well-scaffolded, and intentional fieldwork experiences that connect directly to course content and provide opportunities to apply learned concepts in authentic elementary classroom settings. Fieldwork experiences include clear expectations, with opportunities to plan, teach, and assess students in small groups and whole classes. Fieldwork assignments provide guidance for observation and analysis of student thinking and include reflection prompts.	Syllabi include a variety of fieldwork experiences aligned to course content and provide opportunities to apply learned concepts in elementary classroom settings. Fieldwork experiences include clear expectations with opportunities to plan, teach, and assess. Guidance for fieldwork is provided.	Syllabi incorporate some fieldwork, but the connection to course content and the development of teaching practices is unclear. Opportunities to plan and teach small and whole class lessons are limited, and/or guidance for observation, analysis, and reflection is not clear.	Syllabi lack evidence, or provide minimal evidence, of meaningful fieldwork experiences.
<b>6. Key Assignments and Assessments (12 semester hours)</b>	All syllabi include evidence of a variety of assignments and assessments that require students to apply knowledge and demonstrate a deep understanding of mathematical content and its pedagogical implications. A significant number of assignments promote critical thinking and problem-solving.	All syllabi include evidence of assignments and assessments that require students to apply knowledge and demonstrate a deep understanding of mathematical content and its pedagogical implications. Some assignments promote critical thinking and problem-solving.	Syllabi show evidence that assignments measure students' understanding of mathematical content and pedagogical connections, but assignments may lack variety or have little focus on critical thinking and problem-solving.	Syllabi lack or provide insufficient evidence of assignments and assessments that align with the goals of preparing elementary mathematics teachers.
<b>7. Course Readings and Resources (12 semester hours)</b>	Syllabi include high-quality, research-based readings from reputable sources (e.g., NCTM publications, academic journals, books by leading mathematics educators). The chosen resources provide depth and	Syllabi feature relevant research-based readings and resources that align with course goals.	Readings and resources are partially aligned with course goals. They may be lacking in breadth or depth and/or	Syllabi lack sufficient or appropriate readings and resources to support the development of deep

	breadth in both content and pedagogy and support the development of specialized knowledge of teaching for conceptual understanding.		lack a strong research base.	mathematical understanding and effective teaching practices.
<b>8. Attention to Meeting the Needs of Learners who have challenges in learning mathematics (connected to a minimum of 6 semester hours of coursework)</b>	Syllabi explicitly address the needs of learners who have challenges in learning mathematics, including students with dyscalculia. The syllabi include readings, discussions, and assignments focused on asset-based strategies for supporting all students' mathematical success.	Syllabi address the needs of learners who have challenges learning mathematics and include content related to asset-based strategies for supporting students with dyscalculia and various needs.	Syllabi provide information on addressing the needs of learners who have challenges learning mathematics but provide limited strategies or resources for addressing their needs in mathematics instruction.	Syllabi do not adequately address considerations for meeting the needs of learners who have challenges in learning mathematics.
<ul style="list-style-type: none"> <li>• 32-29 <b>Exemplary</b> - The syllabi demonstrate excellence in all areas, reflecting deep alignment with standards and research, comprehensive content coverage, strong integration of mathematical practices, attention to student thinking, rich fieldwork experiences, meaningful assignments, high-quality resources, and a commitment to meeting diverse learner needs.</li> <li>• 28-24 points <b>Proficient</b> - The syllabi are well-designed and meet each criterion at the Proficient or Exemplary level.</li> <li>• 23-17 points: <b>Approaching</b> - The syllabi partially address the criteria but require significant revisions to align with best practices and research recommendations.</li> <li>• 16-8 points: <b>Needs improvement</b> - The syllabi require substantial redesign to meet the needs of preparing elementary, early childhood, and collaborative special education mathematics teachers effectively.</li> </ul> <p><i>For final ANA Review Committee approval, each criterion must be scored at the Exemplary or Proficient level.</i></p>				

## Appendix B

### Alternative Master's Rubric for Evaluating ANA Courses (Revised May 2025)

Criteria	Exemplary (4)	Proficient (3)	Approaching (2)	Needs Improvement (1)
<b>1. Course Content Alignment with Standards and Research (minimum of 6 semester hours)</b>	Syllabi clearly articulate how <b>each course's content</b> aligns with state standards and research-informed recommendations on elementary teachers' mathematics education. Each syllabus provides evidence of how the course <i>integrates</i> content and pedagogy, addressing both what teachers need to know and how to teach it effectively.	Syllabi align with state standards and incorporate major recommendations from research on elementary teachers' mathematics education. Evidence of the <i>inclusion</i> of both content and pedagogy is provided in each course.	Syllabi partially address state standards and/or may lack specific connections to research on elementary teachers' mathematics education. Limited evidence of the inclusion of both content and pedagogy is provided.	Syllabi demonstrate weak or inconsistent alignment with state standards and research on elementary mathematics education. The inclusion of both content and pedagogy is unclear or absent.
<b>2. Depth and Breadth of Mathematical Content (minimum of 6 semester hours)</b>	The syllabi outline a comprehensive exploration of ALCOS mathematics content across K-5 grades that includes: <ul style="list-style-type: none"> <li>• K-2 content in the ALCOS focused on <u>Foundations of Counting</u> and <u>Operations with Numbers: Base Ten</u></li> <li>• 3-5 content from the ALCOS focused on <u>Operations with Numbers: Base Ten</u> and <u>Operations with Numbers: Fractions</u></li> <li>• ALCOS on <u>Operations and Algebraic thinking</u></li> <li>• <u>Geometry, Measurement and Data Analysis</u></li> </ul> Courses emphasize conceptual understanding and connections across topics.	The syllabi include K-5 mathematics content areas and courses emphasize conceptual understanding for all topics.	Syllabi include most of the K-5 content areas but may lack evidence of teaching for conceptual understanding.	Syllabi omit significant content areas or do not address teaching for conceptual understanding.
<b>3. Integration of Mathematical Practices and Processes (minimum of 6 semester hours)</b>	The syllabi explicitly integrate Student Mathematical Practices (SMPs) and Mathematical Teaching Practices (MTPs) <b>throughout the courses</b> . They include extensive opportunities for teacher candidates to engage in these practices as learners and analyze them from a teaching perspective.	Syllabi provide evidence of integration of SMPs and MTPs throughout the courses, and some course activities from each course provide opportunities for teacher candidates to engage in these practices.	Syllabi provide evidence of limited integration of SMPs and MTPs.	Syllabi do not meaningfully address SMPs and MTPs.

<b>4. Attention to Student Thinking and Common Misconceptions (connected to a minimum of 6 semester hours of coursework)</b>	Syllabi provide evidence of significant attention to analyzing student thinking including learning trajectories and common misconceptions and error patterns. They include readings and assignments that require students to examine student work samples and develop strategies for addressing misconceptions.	Syllabi provide adequate evidence of attention to understanding student thinking and address common misconceptions.	Syllabi provide limited evidence of attention to understanding student thinking and addressing common misconceptions.	Syllabi do not meaningfully address student thinking or common misconceptions.
<b>5. Fieldwork and Clinical Experiences (connected to a minimum of 6 semester hours of coursework)</b>	Syllabi outline a variety of rich, well-scaffolded, and intentional fieldwork experiences that connect directly to course content and provide opportunities to apply learned concepts in authentic elementary classroom settings. Fieldwork experiences include clear expectations, with opportunities to plan, teach, and assess students in small groups and whole classes. Fieldwork assignments provide guidance for observation and analysis and include reflection prompts.	Syllabi include a variety of fieldwork experiences aligned to course content and provide opportunities to apply learned concepts in elementary classroom settings. Fieldwork experiences include clear expectations with opportunities to plan, teach, and assess. Guidance for fieldwork is provided.	Syllabi incorporate some fieldwork, but the connection to course content and the development of teaching practices is unclear. Opportunities to plan and teach small and whole class lessons are limited, and/or guidance for observation, analysis, and reflection is not clear.	Syllabi lack evidence, or provide minimal evidence, of meaningful fieldwork experiences.
<b>6. Key Assignments and Assessments (minimum of 6 semester hours)</b>	All syllabi include evidence of a variety of assignments and assessments that require students to apply knowledge and demonstrate a deep understanding of mathematical content and its pedagogical implications. A significant number of assignments promote critical thinking and problem-solving.	All syllabi include evidence of assignments and assessments that require students to apply knowledge and demonstrate a deep understanding of mathematical content and its pedagogical implications. Some assignments promote critical thinking and problem-solving.	Syllabi show evidence that assignments measure students' understanding of mathematical content and pedagogical connections, but assignments may lack variety or have little focus on critical thinking and problem-solving.	Syllabi lack or provide insufficient evidence of assignments and assessments that align with the goals of preparing elementary mathematics teachers.
<b>7. Course Readings and Resources (minimum of 6 semester hours)</b>	Syllabi include high-quality, research-based readings from reputable sources (e.g., NCTM publications, academic journals, books by leading mathematics educators). The chosen resources provide depth and breadth in both content and pedagogy and support the development of specialized	Syllabi feature relevant research-based readings and resources that align with course goals.	Readings and resources are partially aligned with course goals. They may be lacking in breadth or depth and/or lack a strong research base.	Syllabi lack sufficient or appropriate readings and resources to support the development of deep mathematical understanding and effective teaching practices.

	knowledge of teaching for conceptual understanding.			
<b>8. Attention to Meeting the Needs of Learners who have challenges in learning mathematics (connected to a minimum of 6 semester hours of coursework)</b>	<p>Syllabi explicitly address the needs of learners who have challenges in learning mathematics, including students with dyscalculia. The syllabi include readings, discussions, and assignments focused on asset-based strategies for supporting all students' mathematical success.</p>	<p>Syllabi address the needs of learners who have challenges learning mathematics and include content related to asset-based strategies for supporting students with dyscalculia and various needs.</p>	<p>Syllabi provide information on addressing the needs of learners who have challenges learning mathematics but provide limited strategies or resources for addressing their needs in mathematics instruction.</p>	<p>Syllabi do not adequately address considerations for meeting the needs of learners who have challenges in learning mathematics.</p>
<ul style="list-style-type: none"> <li>• 32-29 <b>Exemplary</b> - The syllabi demonstrate excellence in all areas, reflecting deep alignment with standards and research, comprehensive content coverage, strong integration of mathematical practices, attention to student thinking, rich fieldwork experiences, meaningful assignments, high-quality resources, and a commitment to meeting diverse learner needs.</li> <li>• 28-24 points <b>Proficient</b> - The syllabi are well-designed and meet each criterion at the Proficient or Exemplary level.</li> <li>• 23-17 points: <b>Approaching</b> - The syllabi partially address the criteria but require significant revisions to align with best practices and research recommendations.</li> <li>• 16-8 points: <b>Needs improvement</b> - The syllabi require substantial redesign to meet the needs of preparing elementary, early childhood, and collaborative special education mathematics teachers effectively.</li> </ul> <p><i>For final ANA Review Committee approval, each criterion must be scored at the Exemplary or Proficient level.</i></p>				

## Appendix C



AMTE HEADQUARTERS ▾ MEMBERSHIP ▾ PROFESSIONAL LEARNING ▾ PUBLICATIONS ▾ ADVOCACY/EQU

# Connections

An official AMTE publication for the mathematics teacher education community.

## Navigating the Alabama Numeracy Act Together: Collaborative Efforts Support Mathematics Teacher Educators to Improve Elementary Teacher Preparation

Fall 2025

Angela T. Barlow (Univ. of South AL), Megan Burton (Auburn Univ.), Kelly O. Byrd (Univ. of South AL), Sarah Roller Dyess (Univ. of AL-Huntsville), Susan Swars Auslander (Univ. of AL), Taajah Witherspoon (Univ. of AL-Birmingham)\*

**Connections:** <https://amte.net/connections/2025/08/navigating-alabama-numeracy-act-together-collaborative-efforts-support>

*An official Association of Mathematics Teacher Educators (AMTE) publication for the mathematics teacher education community.*

### **Navigating the Alabama Numeracy Act Together: Collaborative Efforts Support Mathematics Teacher Educators to Improve Elementary Teacher Preparation**

Fall 2025

Angela T. Barlow (Univ. of South AL), Megan Burton (Auburn Univ.), Kelly O. Byrd (Univ. of South AL), Sarah Roller Dyess (Univ. of AL-Huntsville), Susan Swars Auslander (Univ. of AL), Taajah Witherspoon (Univ. of AL-Birmingham)\*

*Alabama stands out as a promising example, demonstrating significant gains in their 2024 NAEP mathematics scores. The 2022 Alabama Numeracy Act focused attention on improving mathematics instruction by providing targeted professional development for teachers, illustrating the impact of systemic, math-specific support. (NCTM, 2025, [Statement from the National Council of Teachers of Mathematics on the release of 2024 NAEP mathematics scores](#))*

The National Council of Teachers of Mathematics (NCTM, 2025) recently highlighted Alabama's statewide efforts under the 2022 Alabama Numeracy Act (ANA, Alabama State Legislature, 2022), a

legislative initiative aimed at improving grades K–5 mathematics instruction. The ANA represents a pivotal shift in mathematics education, seeking to strengthen foundational numeracy skills and provide all K–5 students with high-quality instruction from well-prepared educators. This initiative takes place within the broader national conversation about the urgent need for systemic change in mathematics education. Professional organizations such as NCTM and the Association of Mathematics Teacher Educators (AMTE) have underscored the importance of research-based instructional strategies and robust teacher preparation. Alabama’s efforts serve as a model for how collaborative, statewide initiatives can address these challenges through strategic reform.

Thus far, the state’s efforts have largely focused on supporting practicing elementary teachers, and the next phase of improvement focuses on K–5 educator preparation—aligning with AMTE’s 2024–2028 Long-Term Goal #2: to support and guide high-quality preparation, recruitment, retention, and diversification of mathematics teachers across educational spaces. We are six mathematics educators from teacher preparation institutions across Alabama who came together through our professional networks, including AMTE. Our group meetings and discussions quickly evolved into a broader statewide initiative, bringing together faculty, administrators, and educational leaders to navigate ANA implementation. This article was conceived at one of those gatherings, where we found ourselves at the same table, ready to tackle the complex task of aligning our programs with a new vision for mathematics teacher preparation.

### **Our Context: The Alabama Numeracy Act**

Passed in 2022 in response to significant concerns about students’ mathematics learning and achievement, the ANA is the “state’s comprehensive plan to improve math instruction and support for all students and teachers” at the elementary level (A+ Education Partnership, 2022, p. 1). There are several components and associated initiatives, with examples including: (a) the use of a mathematics coach in every elementary school; (b) the establishment of an Elementary Math Task Force, whose work partially includes vetting and approving high-quality instructional materials, curricula, and assessments for schools; and (c) the implementation of an Alabama Summer Mathematics Achievement Program that provides additional learning supports in mathematics for 4th–5th graders. The ANA also established the Office of Mathematics Improvement (OMI) and a Postsecondary Math Task Force to “ensure our teacher preparation programs are effectively preparing our new elementary educators to teach mathematics” (A+ Education Partnership, 2022, p. 2).

The ANA requires significant changes for candidates seeking certification in areas that include the teaching of K–5 mathematics. With OMI spearheading the improvement efforts, it is now a requirement that *all K–5 mathematics teacher candidates (including early childhood, elementary, and special education) complete 12 credit hours of integrated mathematics content and pedagogy courses, with nine of those credit hours being at the junior/senior level*. Although OMI provided guidance on the learning outcomes for mathematics content and pedagogy and related field experiences, it has been at the discretion of individual institutions of higher education to reimagine and design their programs. Importantly, the guidance focuses on the development of

courses that integrate content and pedagogy, regardless of the department in which the courses are taught. This was and continues to be a substantial pivot for most of the state's institutions. Prior to the ANA, education departments typically offered 1–2 mathematics methods courses during the junior/senior years, with mathematics departments offering several mathematics content courses (some specifically for elementary teachers). Notably, the shift toward integrated courses aligns with recommendations from professional organizations and research (AMTE, 2017; Garner et al., 2023; Isenberg, 2000).

To address the new requirement, we have engaged in multiple collaborative efforts with one another and with others across the state and at our respective institutions. We are excited to offer course experiences that provide K–5 mathematics teacher candidates with opportunities to deeply learn relevant, important, and rigorous mathematics while simultaneously learning ambitious and equitable pedagogy for early childhood and elementary classrooms (AMTE, 2017).

### **Integrated Course Design**

Much of our initial discussion focused on our different university contexts and the opportunities and constraints that these offered, including those related to institutional and program size, faculty capacity, organizational structure and culture, and resources. For example, variability existed related to:

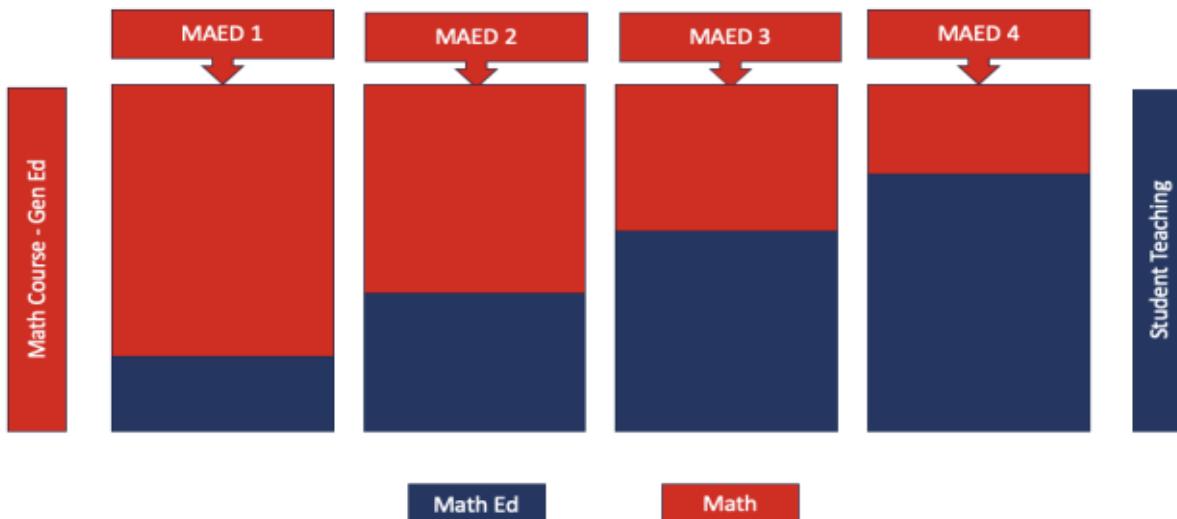
- the number of programs impacted by the ANA (e.g., one at the University of South Alabama compared to three at Auburn University);
- the location of faculty resources, whether in the college of education, the mathematics department, or both; and
- the percentage of students who transfer from community colleges.

Given the contextual differences, two points became clear. First, we were not going to be able to develop a single set of courses that could be utilized at all institutions. Second, our discussions needed to focus on big ideas that could inform the unique design at each institution.

One of these big ideas was related to the proportion of learning objectives focused on mathematics content or mathematics pedagogy in each of the four courses, which varies across different institutions. It is important to note that while these proportions may differ across the four courses, learning experiences should emphasize integrated content and pedagogy. An example of varying proportions might involve conceptualizing the four courses as a progression that begins with the teacher candidate as a learner of mathematics and then gradually shifts to the teacher candidate as a teacher of mathematics, while providing integrated learning experiences throughout. As represented in Figure 1, the first course (MAED 1) includes 80% content- and 20% pedagogy-focused learning objectives, where candidates focus on what it means to be a learner and doer of mathematics (e.g., engaging in the student mathematical practices, problem solving, and reasoning) while at the same time learning new mathematics content. Then, the emphasis shifts across the courses leading to the fourth course (MAED 4) including 20% content- and 80%

pedagogy-focused learning objectives, where candidates are implementing and evaluating lessons about mathematics content. When bookended with a general education mathematics course and the student teaching experience, this distribution offers one compelling vision of the development of a teacher candidate and is being taken up by some of the universities in our group.

**Figure 1. An Example Distribution of Content- and Pedagogy-focused Learning Objectives**



Importantly, this is just one of many possible configurations, as the ANA did not establish required proportions of content- and pedagogy-focused learning objectives within each of the four courses, just that they must demonstrate an integration of content and pedagogy. Therefore, each of us developed the design for our course sequence based on our universities' unique contexts. For example, some institutions are balancing learning objectives through courses taking more of a 50% content, 50% pedagogy approach, while centering on integrated learning experiences. There was also variability by institution in whether courses were being offered via education and/or mathematics departments, with OMI's requirements for strong connections and applications in field placement classrooms necessitating that most of the courses be offered in education departments that oversee field experiences. For some institutions, course development afforded opportunities for collaboration across departments, particularly when faculty with expertise in elementary mathematics education were housed in both mathematics and education departments.

### **Collaboration with MTEs and Vested Partners**

Key to this initiative is that although there were certain non-negotiables, OMI was open to feedback, and the changes being made were collaborative in nature, which meant the collective voices of mathematics teacher educators were sought and valued. We leveraged our unique experiences and the support and resources of our professional organizations, such as the *Standards for the Preparation of Mathematics Teacher Educators* (AMTE, 2017). We also discussed what the research suggests is needed for effective preparation of elementary mathematics teachers (Ball et al., 2008; Garner et al., 2023; Graham & Fennell, 2001; Hill et al., 2005).

As each of us began to consider how changes could best be implemented to support teacher candidates in our unique contexts, as well as associated challenges, we leaned on each other. The years of working alongside one another via service, meetings, and discussions in our national and state organizations, including AMTE, solidified our relationships and developed common understandings. Trust had been built, which allowed for honest exchanges around our questions, concerns, and hopes.

The relationships and shared understandings developed over years were helpful, as we were also working in collaboration with other vested partners, such as colleagues in the OMI, the Alabama Mathematics, Science, and Technology Initiative, K-12 school faculty, legislative representatives, and two-year college partners. In addition, while most of us focus on elementary education, we were also collaborating with our early childhood, special education, and mathematics colleagues, as their programs were impacted by the required changes. We held virtual meetings, in-person meetings, and a one-day planning session to discuss and collaboratively work on the new courses and programmatic changes. These critical conversations provided opportunities to hear other perspectives, revise current thinking, and develop courses that embrace the vision of the AMTE Standards (AMTE, 2017).

### **Final Thoughts**

We share our story to provide insights into how we leveraged our networks and resources to improve K-5 mathematics teacher preparation. We close with these final thoughts. First, AMTE and its affiliates are important spaces in which to network, build a common vision for mathematics teacher education, and share problems of practice. We encourage other MTEs to connect with their [AMTE state affiliate](#) or network around a common topic through an [AMTE community circle](#). Second, collaboration among university-based mathematics teacher educators is impactful, but real change happens when we are able to work and communicate effectively with other vested partners around a shared vision. MTEs should consider expanding their circle of collaborators, including to those who make decisions, such as state department colleagues, so that their voices are heard. Third, although our integrated courses may look different due to unique institutional contexts and strengths, MTEs should work together on coursework components (e.g., curricula, assessments, field experience assignments) designed to prepare teachers who are well-equipped to provide high-quality instruction for all K-5 students. We recommend that MTEs leverage AMTE publications and other spaces to share and discuss how they have strengthened coursework through collaboration.

Elementary MTEs have been challenged to provide integrated, meaningful experiences that effectively prepare teachers, as research suggests that teacher content knowledge, pedagogical content knowledge, and affect impact the instruction they provide, thus ultimately influencing student learning (Tsamir & Tirosh, 2009). In addressing that challenge, we continue to meet and collaboratively work toward creating integrated coursework at our own institutions. Ongoing, honest conversations about our successes and struggles in our contexts will be crucial to our continual growth and cultivation of community as mathematics teacher educators.

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\*Author listing is based on alphabetical order.

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## Appendix D

## Academic Program Inventory of Numeracy EPPs (as of December 2025)