

February 21, 2022

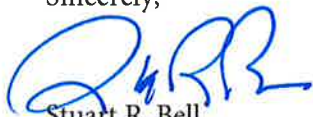
Chancellor Finis St. John  
The University of Alabama System  
500 University Boulevard East  
Tuscaloosa, Alabama 35401

Dear Chancellor St. John:

I am pleased to endorse the recommendations of Executive Vice President and Provost James Dalton and Deans Susan Carvalho of the Graduate School and Peter Hlebowitsh of the College of Education for approval of the attached proposal for a graduate certificate in Measurement and Psychometrics. The 18-credit-hour graduate certificate will emphasize competencies and skills necessary to perform psychometric analyses preparing students from various disciplines to conduct research that links variables to a wide variety of social, economic, educational, and health outcomes.

If you approve of this certificate, I would appreciate you forwarding this request to the Board of Trustees for their approval.

Sincerely,



Stuart R. Bell  
President

Enclosures

c: Executive Vice President and Provost James Dalton  
Dean Peter Hlebowitsh  
Dean Susan Carvalho



February 21, 2022

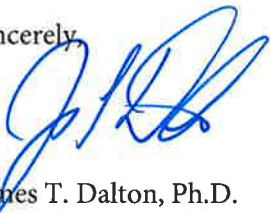
President Stuart R. Bell  
The University of Alabama  
203 Rose Administration Building  
Tuscaloosa, Alabama 35487

Dear President Bell:

I join Dean Peter Hlebowitsh, College of Education, and Dean Susan Carvalho, the Graduate School, in recommending for your approval the attached graduate certificate in Measurement and Psychometrics. The 18-credit-hour certificate will emphasize competencies and skills necessary to perform psychometric analyses preparing students from various disciplines to conduct research that links variables to a wide variety of social, economic, educational, and health outcomes.

If you approve of this certificate, please forward this request to the Chancellor at your earliest convenience.

Sincerely,



James T. Dalton, Ph.D.  
Executive Vice President and Provost

Enclosures

c.: Dean Peter Hlebowitsh  
Dean Susan Carvalho

February 8, 2022

Provost James Dalton  
The University of Alabama  
Office for Academic Affairs  
254 Rose Administration Building  
Tuscaloosa, AL 35487

Dear Provost Dalton:

I join Dean Peter Hlebowitsh in recommending the approval of the attached proposal for new Non-Degree Seeking Graduate Certificate in Educational Studies in Psychology, Research Methodology and Counseling offered through the College of Education. The proposed certificate in Measurement and Psychometrics (CIP: 13.0603) meets specific student and programmatic needs and will attract new graduate enrollments.

This concentration was recommended for approval by the Graduate Council of The University of Alabama at its meeting on February 2, 2022. We ask for timely handling of this item so that it may be considered at the April 2022 Board of Trustees meeting.

If you approve of this proposal, please forward this request to President Bell at your earliest convenience.

Sincerely,



Dr. Susan Carvalho  
Associate Provost and Dean of the Graduate School

cc.: Dr. Andre Denham, Associate Dean, Graduate School

October 5, 2021

Dr. Stefanie A. Wind  
Associate Professor, Educational Research  
The University of Alabama  
Tuscaloosa, AL 35487

Dear Dr. Wind:

I am pleased to support the Graduate Certificate in Measurement and Psychometrics in the Educational Studies in Psychology, Research Methodology, and Counseling Department. I acknowledge that all relevant parties to the change, including departmental faculty and the department head, have fully vetted the proposed certificate and unreservedly endorse it.

Sincerely,



Peter Hlebowitsh  
Professor and Dean



# The University of Alabama

## Curriculum Plan

<b>College:</b>	<b>Education</b>
<b>Department:</b>	Educational Studies in Psychology, Research Methodology, and Counseling
<b>Proposed Program:</b>	Certificate in Measurement and Psychometrics

Complete and Submit with the proposal for new certificate.

### Curriculum Plan

<b>YEAR 1</b>	
<b>Semester 1</b>	
<b>Course Number/Name</b>	<b>Credits</b>
<i>BER 657: Applications of Psychometric Theory</i>	<b>3</b>
<b>Semester 2</b>	
<i>BER 641: Applied Regression Analysis</i>	<b>3</b>
<i>BER 658: Psychometrics Theory and Practice</i>	<b>3</b>
<b>YEAR 2</b>	
<b>Semester 1 (Choose one of the following)</b>	
<i>BER 669: Item Response Theory</i> <i>BER 670: Rasch Techniques for Constructing and Evaluating Measurement Instruments</i> <i>BER 671: Cognitive Diagnostic Models</i> <i>An elective course from the certificate program options</i>	<b>3</b>
<b>Semester 2 (Choose one of the following)</b>	
<i>BER 669: Item Response Theory</i> <i>BER 670: Rasch Techniques for Constructing and Evaluating Measurement Instruments</i> <i>BER 671: Cognitive Diagnostic Models</i> <i>An elective course from the certificate program options</i>	<b>3</b>
<b>YEAR 3</b>	
<b>Semester 1 (Choose one of the following)</b>	
<i>BER 669: Item Response Theory</i> <i>BER 670: Rasch Techniques for Constructing and Evaluating Measurement Instruments</i> <i>BER 671: Cognitive Diagnostic Models</i> <i>An elective course from the certificate program options</i>	<b>3</b>
<b>Total Credits</b>	<b>18</b>

*Alabama Commission on Higher Education*

**Submission of a New Non-Degree Certificate  
(Part 1: Description and Rationale)**

**Institution: The University of Alabama**

**1. Date of Certificate Submission: April 2022**

**2. Institutional Contact Person:**

Andre Denham

**Title:**

Associate Dean for Graduate Academic Affairs

**Telephone:**

205-348-8283

**Email:**

adenham@ua.edu

**3. Program Identification:**

Award Level (Undergraduate, Graduate, Post-Master's): Graduate

Title: Measurement and Psychometrics

6-digit CIP: 13.0603

**4. Program Administration and Implementation:**

Name of College/ School: College of Education

Name of Dean: Peter Hlebowitsh

Name of Department: Educational Studies in Psychology, Research Methodology  
and Counseling

Name of Chairperson: Michael Lawson

Proposed program implementation date:

Fall 2023

Anticipated ACHE meeting for notification:

September 2022

Other considerations for timing and approval (e.g., upcoming SACSCOC review):

## **5. Program Design:**

### **Brief Description of Program and Objectives:**

The Graduate Certificate in Measurement and Psychometrics emphasizes competencies and skills necessary to perform psychometric analyses that reflect best practices in contemporary psychometric research, theory, and practice. This 18 credit-hour certificate prepares students from various disciplines to conduct research that links latent variables (i.e., concepts that researchers cannot measure directly) to a wide variety of social, economic, educational, and health outcomes. Courses required for this certificate include advanced research and measurement courses that, while grounded in Education, provide students from multiple academic disciplines and helping fields with significant and valuable research knowledge and skills. These skills will provide students with a unique interdisciplinary tool kit that will enable them to conduct cutting-edge quantitative research in a wide variety of research contexts and settings.

Although this certificate will be offered by the College of Education, students from all disciplines are welcome, as measurement and psychometrics represent a primary methodological challenge and frontier for social, educational, and health policy research for the next decade and beyond.

### **Need/Rationale: Briefly describe why this certificate is needed at UA.**

The Graduate Certificate in Measurement and Psychometrics is aligned with the University of Alabama's strategic mission related to teaching and research. The structured sequence of courses offered in the certificate will allow current and future students to gain skills and competencies that are essential for conducting cutting-edge research and providing high-quality instruction in the social sciences.

Measurement represents a primary priority and methodological frontier for social and educational research. As research becomes more nuanced, needs exist for methods that enable scholars to identify the mechanisms that help link inputs (such as instruction/service provision) to educational, health, social, and economic outcomes. To accurately capture desired social/psychological processes and outcomes in social research, researchers need to make inferences about latent phenomenon (i.e., latent variables), based on the things that they can observe (e.g., educational and psychological test scores or survey responses). This "leap" between latent variables and observed scores often introduces significant error and threats to validity into research studies. For this reason, the validity of educational and social research and testing depends on valid measures that are developed using the best measurement-oriented methodologies. What is more, universities around the world are seeking candidates who are highly skilled in measurement and psychometric theory. This certificate will allow students to build their knowledge of measurement and

psychometrics and thus promises to make our graduates competitive candidates for research and teaching positions in universities as well as private sector corporations (e.g., The Educational Testing Service).

The Educational Research program at the University of Alabama currently offers coursework in measurement and psychometrics. The Graduate Certificate in Measurement and Psychometrics will allow graduate students who are not pursuing a PhD in research methodology to gain experience and qualification in measurement and psychometrics that can improve their current and future research and practice in social science research. Specifically, the Graduate Certificate in Measurement allows students to gain a deep understanding of modern measurement techniques, methods, and theories. Students who earn the Graduate Certificate in Measurement and Psychometrics will be able to provide leadership in questionnaire development, survey and test data analysis, and data interpretation. These methodological skills will be viewed by colleagues in the field as well-rounded and they will be more competitive candidates in job markets as a result. For example, students who complete this certificate program may be eligible to teach methodology courses in measurement and psychometrics and conduct methodological research related to measurement and psychometrics, even if their PhD is in another discipline—thus expanding their range of potential jobs and giving them an additional competitive edge over other candidates.

**Projected Enrollment: Use the fields below to indicated projected total enrollment in years 1 - 5 of the certificate program.**

**Year 1:** 5  
**Year 2:** 5  
**Year 3:** 10  
**Year 4:** 10  
**Year 5:** 20

**Projected Completions: Use the fields below to indicated projected total completions in years 1 - 5 of the certificate program.**

**Year 1:** 4  
**Year 2:** 4  
**Year 3:** 8  
**Year 4:** 8  
**Year 5:** 16



**Projection Rationale:** Please provide rationale for the enrollment and completion projections listed above. The narrative should briefly explain how the projections were determined. List and describe any surveys done of local/regional/national target students. Also describe any national data that exists on the need for this type of certificate.

Students who complete the Graduate Certificate in Measurement and Psychometrics will include students who are already enrolled in the Educational Research program as well as students from other programs. The Educational Research program currently enrolls 2-3 students each year who focus on measurement and psychometrics, and all of these students will complete the Certificate in Measurement and Psychometrics. We expect to gradually add other students to the certificate program during the first two years. Typically, about 50% of students enrolled in our measurement and psychometrics classes belong to other programs in the College of Education, while at least 20% enroll from other academic units on campus (e.g., psychology and human development). We anticipate that this certificate program will increase enrollment across all of our courses, since measurement and psychometric theory are foundational to current research and coursework emphasized in Quantitative Psychology, Human Development, Social Work, Communications, Nursing, and Public Health. Skills emphasized in the Graduate Certificate in Measurement and Psychometrics are foundational to the work currently underway within the College of Education, especially in the Departments of Curriculum and Instruction as well as Special Education and Multiple Abilities.

**Resources:** Briefly describe personnel, physical facilities, equipment, library holdings, etc. needed for this program. Explain whether these are new or existing resources.

The Educational Research program has nine full time faculty members with expertise in measurement (Drs. Cao, Guo, Lakin, Lawson, Ma, Man, Lee, Schumacker, and Wind) who can offer courses toward this certificate. The courses for this certificate will use the current computer labs at the College of Education and existing statistical software programs provided by the university. Additional investments in statistical software may be necessary in future years.

Proposed delivery format (100% in-person, 100% online, hybrid, multiple formats):

Multiple formats: Currently, all of the certificate courses are offered 100% in-person, with the exception of BER 657, which has one online section that is offered each fall.

If hybrid, what % of program will be delivered online? N/A

If multiple formats, which ones? 100% in-person, one course 100% online.

Total Credit Hours required to complete the program (if range, enter minimum):

18 credit hours

Please identify any specialized accreditation agency that may apply to this program and explain why your institution does or does not intend to seek specialized accreditation.

N/A

Will the curriculum require work-based or experiential learning (internship, practicum, etc.)? If yes, please explain. Definitions and examples of different types of work-based learning are available at <https://www.alapprentice.org/>.

No.

Will the program be designed to meet educational requirements licensure and/or certification required for entry-level employment? If yes, please list license and/or certification(s).

No.

## **6. Employment Occupational Alignment**

Using the federal Standard Occupational Code (SOC) System, please indicate the top three occupational codes related to post-graduation employment from the program. A full list of SOC codes can be found at <https://www.onetcodeconnector.org/find/family/title#17>. A list of Alabama's "In-Demand Occupations" is available at <https://ache.edu/Instruction.aspx>

SOC 1 (required) :

19-3099.00      Social Scientists and Related Workers, All Other

SOC 2 (optional)

19-3022.00      Survey Researchers

SOC 3 (optional)

15-2051.00      Data Scientists

### **Others:**

15-2041.00      Statisticians

19-3033.00      Clinical and Counseling Psychologists

19-3039.00	Psychologists, All Other
19-3034.00	School Psychologists

### **7. Relationship to other programs within the institution:**

Is the proposed program associated with any existing offerings, including options within current degree programs? If yes, please explain. If this is a graduate program, please list any existing undergraduate programs which are directly or indirectly related. If this is a doctoral program, also list related master's programs.

The Graduate Certificate in Measurement and Psychometrics is made up of courses that are currently offered by the Educational Research Program. There is the potential for students to share 6 credits with the existing certificate program in Quantitative Research. Therefore, no other resources are needed to implement the certificate program. It is possible for students to become certified in both measurement and quantitative research by taking 30 credits. We view this cross-over as important and necessary as measurement and quantitative modeling are the two fundamental pieces of quantitative research in the social sciences.

The certificate program is distinct from existing degree programs and certificate offerings that are currently available at UA as well as other research universities in the State of Alabama. Although other academic units on campus (e.g., Business and Psychology) offer classes in measure, there is no formal sequence of measurement and psychometrics courses that are offered to students at UA. For this reason, the measurement certificate promises to significantly improve the marketability and employment chances for all doctoral students at UA who complete the certificate program.

**Student Learning Outcomes: What do you expect students to be able to do after successfully completing the certificate program? Succinctly list at least four (4) learning outcomes, but no more than seven (7).**

#### **Certificate SLOs**

1. Students will apply appropriate methods to collect and interpret evidence related to reliability, validity, and fairness in measurement.
2. Students will conduct an item/test analysis from measurement theories.
3. Students will apply principles of measurement theory and its applications in designing, analyzing, evaluating, and revising measurement instruments.
4. Students will read, interpret, and critically evaluate measurement methodologies, reported outcomes and subsequent interpretations, as found in educational and behavioral research journals.

### **Certificate SLOs**

5. Students will develop questionnaires and surveys with sound psychometric properties.
6. (College of Education Advanced SLO 1): Students will demonstrate advanced content knowledge and professional expertise to meet the needs of those they serve.

**Evaluation and Assessment: Describe the process to determine whether or not the certificate program is meeting both the Expected Program Outcomes and the Expected Student Learning Outcomes (SLOs). Include outcomes, methods, and timing of assessments, using a format consistent with the current format used by the office of the Director of Institutional Effectiveness and/or your college's assessment officer.**

We will evaluate and assess programmatic outcomes in three primary ways. First, we will monitor our enrollment, retention/completion, and attribution numbers by academic department and discipline and will adjust based on emergent trends. We will track students' employment status following graduation, and we will also monitor the number of publications using psychometric methods that students secure prior to graduation. Last, as a part of our quality and improvement efforts, we will look for trends between our SOI evaluations and student retention/attrition rates.

Next, we will evaluate and assess student learning outcomes (SLOs) using assignments included in each of our certificate courses. The attached document (Curriculum Map Alignment to SLOs) shows the alignment between assignments from the primary certificate curriculum map on to the certificate SLOs. Syllabi for these courses are also included as an attachment; the syllabi include details about how these assignments are structured and evaluated.

## Submission of a New Non-Degree Certificate (Part 2: Course Information)

Please complete the table below indicating all coursework for the proposed program, specifying any new courses developed for the program, along with courses associated with each option as applicable. Include the course number, and number of credits. The classes are sequenced such that the required courses should be completed before students progress toward advanced coursework. From there, students can take courses in the order that they choose. However, BER 687 and BER 689 should not be taken for the certificate until students have completed two or more advanced courses (e.g., Electives and/or Advanced Measurement Courses). Coursework listed should total the number of hours required to complete the program.

Course Number and Title		Number of Credit Hours	* If New Course
Required Courses	BER 641 Applied Regression Analysis	3	
	BER 657 Applications of Psychometric Theory	3	
	BER 658 Psychometrics Theory and Practice	3	
Select two of the following Advanced Measurement Courses:	BER 669 Item Response Theory	3	
	BER 670 Rasch Techniques for Constructing and Evaluating Measurement Instruments	3	
	BER 671 Cognitive Diagnosis Models	3	
Select one of the following Electives:	BER 646 Structural Equation Modeling	3	
	BER 648 Advanced Structural Equation Modeling	3	
	BER 687 Field Work Educational Research	3	
	BER 689 Practicum Educational Research	3	
	BER 695 Special Topics in Educational Research	3	

### Transfer Credit:

Students may substitute BER642 Advanced Regression Methods for BER639 (Applied Regression Analysis). Other transfer credits will be approved on a case-by-case basis, but will typically not be accepted. The maximum number of credits to be transferred is 12.

### Hours that Might be Used Later (if any) if Admitted to a Degree Program:

ALL (18 hours and beyond, all courses are advanced doctoral level research courses)

Intended program duration in semesters for full-time students: 5 semesters

Intended program duration in semesters for part-time students:

6-8 semesters. The expected time to complete the certificate is consistent with the qualitative and quantitative certificates offered by Educational Research, both of which have robust enrollments and take approximately the same amount of time to earn.

Describe any other special admissions or curricular requirements for the program:

**Application:** Students will be required to submit an application that includes a Statement of Purpose. This requirement applies to both degree earning and non-degree earning students. In order to be eligible for admission, students need to have completed a basic statistics class at the graduate level (e.g., BER 540 or its equivalent) with a grade of "B" or better and they need to have either completed their masters, or they need to be enrolled in a graduate program at the university. A cumulative graduate GPA of 3.0 or better is required for admission. These requirements represent minimum standards/competencies that are required for admission. Admission decisions will be determined on a case-by-case basis.

**Admission Criteria:** Application Materials include 1) Statement of Purpose focusing on the student's goals in pursuing a Measurement certificate and 2) evidence of prerequisite statistics courses comparable to BER 540 Statistical Methods in Education, must have achieved a grade of B or better in prerequisite statistics courses. General Requirements are below:

1. Student must be accepted to the Measurement non-degree certificate program by the Graduate School and departmental faculty.
2. Applications will consist of evidence of a statement of purpose and evidence of prerequisite statistics courses.

**General Requirements:**

1. Prerequisites:

Evidence of prerequisite statistics courses comparable to BER 540 Statistical Methods in Education, must have achieved a grade of B or better in prerequisite statistics courses.

2. Minimum Required Hours (15-18 is typical best practice; 12 is possible with stronger justification):

The certificate is 18 credit-hours.