

GRADUATE COUNCIL: NEW COURSE PROPOSAL

Originating Unit: HCHS

Type of action: New course Full online course**

Semester and year course will take effect: Fall 2024

New course title: Measurement Methods and Instrumentation

Appropriate computer abbreviation (30 spaces or less): Measurement

Course instructional methodology: Lecture

course component types: [ugradcouncil.tcu.edu/forms/Course Component Types.pdf](http://ugradcouncil.tcu.edu/forms/Course%20Component%20Types.pdf)

New course number: 80243

Prerequisites for new course: *include an attachment if additional space is needed*

HCHS 60021; HCHS 70112

Click here to attach a file

attached files can be seen and managed in Acrobat Pro by clicking on View > Show/Hide > Navigations Panes > Attachments

Description of new course (catalog copy): *include an attachment if additional space is needed*

This course is designed to advance knowledge and skill in measurement as a foundational necessity for scientific research. It covers a range of concepts and methods that can be used to analyze instruments utilized in published research, draft methodological research, and perform procedures.

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Fully Online Courses**

All online courses, and /or distance learning offerings must meet State Compliance regulations as defined by specific state legislation. TCU Distance Learning is any for-credit instruction provided to a TCU student outside the State of Texas. This includes internships, clinical, video conferencing, online, or any other delivery format that crosses state lines. Contact the Koehler Center for Teaching Excellence for guidelines. Include a letter of support from the Koehler Center with this proposal.

Supporting evidence or justification: (For a new course, attach proposed syllabus, including course objectives, course outline, and representative bibliography.)

Describe the intended outcomes of the course and how they will be assessed: *include an attachment if additional space is needed*

[Click here to attach a file](#)

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Additional resources required:

Faculty: 0

Space: 0

Equipment: 0

Library: 0

Financial Aid: 0

Other: 0

Change in teaching load: None; this course is already offered as special topics

Does this change affect any other units of the University? Yes No

If yes, submit supporting statement signed by chair of affected unit.


If cross-listed, provide evidence of approval by all curriculum committees appropriate to both the originating and the cross-listed units.

Chair of Originating Unit:

Name: Emily Lund

Unit: HCHS PhD in Health Sciences

Signature: **Lund, Emily**

 Digitally signed by Lund, Emily
Date: 2023.10.02 12:32:29 -05'00'

HCHS 80243 Measurement

Instructor Name:
Semester and Year:
Number of Credits: 3
Class Location:
Class Meeting Day(s) & Time(s):
Zoom Access Information:
Office Location:
Office Hours:
Telephone:
Email:
Response Time:

Final Exam Date & Other Important Dates

Final Paper is due no later than midnight on

Course Description

This course is designed to advance knowledge and skill in measurement as a foundational necessity for scientific research. It covers a range of concepts and methods that can be used to analyze instruments utilized in published research, draft methodological research, and perform procedures.

Learning Outcomes

Upon completion of this course, students should be able to:

1. Evaluate key quality indicators in instruments used in research.
2. Appraise measurement methods in published quantitative and qualitative research.
3. Develop instruments that can be utilized in research.
4. Advance measurement science

The course meets the following PhD in Health Sciences program requirements:

- Research Knowledge and Skills: Manuscript development

Prerequisites

Type prerequisites here. HCHS 60021; HCHS 70112

Required Texts / Materials

Devellis, R. & Thorpe, C. (2021). Scale Development: Theory and Applications (5th Edition). Sage Publishing.

Additional / Supplementary Resources

Supplementary materials such as videos, articles, websites, social media, pictures, may be provided by instructor.

Teaching Philosophy

Doctorally prepared professionals are the future of any discipline. As such, they should have the expertise required to advance the discipline. Doctoral education, therefore, requires rigorous examinations of essential knowledge and skills that exist today while envisioning and creating new knowledge for tomorrow. My role is to facilitate those examinations, all the while encouraging you to move beyond what is known today, to successfully achieve your responsibilities of tomorrow. Your role is to be prepared for each class having read the materials, completed assignments, formulated questions, and actively participate to maximize the benefit of a seminar-based learning strategy.

Instructional Methods

This course is a hybrid course and will utilize a mixture of synchronous and asynchronous instructional methods. Weekly topics pertaining to measurement in research will include review of current published research, scholarly discussion, experiential learning, presentation of work, and peer feedback.

Course Policies and Requirements

Assignments and Grading

Final Grade Elements / Grade Breakdown:

Outcome(s)	Assignments, Exams/Quizzes, Presentations, etc.	%
1, 2	Literature Review of Available/ Current Measurement Tools r/t your research topic	25
1, 2	Appraising Measurement in Published Research	25
1, 2, 3, 4	Scholarly Discussions	25
3, 4	Scale Development Exercise	25

Literature Review of Available/ Current Measurement Tools r/t your research topic

This literature review will help students discover current and available instruments/ measurement methods related to their field of study. A minimum of five studies are required.

Your area of interest may have many published tools and so you may describe five different studies about five separate instruments. Or your area of interest may have very few developed instruments. If this is the case you may describe multiple different studies that describe the same tool (often when developing an instrument multiple manuscripts are published about the process) or you may choose measurement that is adjacent to your area of interest.

Appraising Measurement in Published Research

Students will select an article of interest that **addresses reliability and validity** of an instrument measure a latent variable. Using that article, students will write a 2-5 page essay that addresses the following items/ questions.

- Describe the purpose/aim/goal of the research.
- Introduction: Why is reliability and validity important in published research?
- Identify a key variable and describe how it was measured.
- Describe how the researchers reported reliability on the measurement from previous studies, population, what type of reliability, any statistics, etc.
- Did the researchers address reliability appropriately? If yes, reference your position. If no, explain why and describe how it could be improved – and reference.
- Did the researchers describe reliability of the variable as it pertains to their study you are reading? If yes, was it appropriate? If no, explain what reliability they should have reported?
- Describe how the researchers reported validity, population, what type, any statistics, etc.
- Did the researchers address validity appropriately? If yes, reference your position. If no, explain why and describe how it could be improved – and reference.
- Is the instrument generalizable across populations or groups? If not, is this acceptable for the instrument?
- What are the limitations of the instrument development process?
- Conclusions: What conclusions can be drawn about the study based solely on your appraisal of reliability and validity? Does it impact other areas reported in the study? If so, which ones? What are the risks when reliability and validity are not reported or are reported insufficiently in published research? Additional thoughts?

Scholarly Discussions

Scholarly discussions are intended to provide clarity and extend current knowledge, as well as respectfully challenge one's ideas and those of others. Discussions may occur in the classroom setting or asynchronously via online discussion boards.

Scale Development Exercise

Each student will create a five- ten item Likert scale to measure a latent variable of their choice. Students will be asked to present their procedure, rationale and results from the instrument development process in a presentation to the class. Students will be expected to follow and identify an instrument development framework to guide the tool development process. The instrument development framework should include at minimum 1. Expert review 2. Pilot study 3. Review and rewriting of items based on results, feedback.

Grading Scale

Grade Distribution:

A	90.00 -100.00
B	80.00- 89.99
C	70.00- 79.99
F	69.99 and below

Late Work

All required work must be submitted via email to the instructor by the time and date designated.

If extenuating circumstances impede a student in completing their work in time, this needs to be made known in advance of the due date to the instructor with legitimate reasons and proof. The student may request late submission of specific work due to extenuating circumstances. Such request must propose a reasonable new submission date and be submitted to the instructor within 24 hours of extenuating circumstances occurrence. The request will be reviewed, and the student will be informed whether late submission is granted within 24 hours upon receipt. The Chain of Communication for Graduate Courses will be followed with concerns.

Grading Concerns

Chain of Communication for Graduate Courses If you have any questions or concerns about your experiences in this course, the first step is to communicate these questions or concerns directly with the person(s) involved. Your instructor is your primary contact for any questions or concerns that arise with this course. The chain of communication for this course is • Your instructor (Dr. Yan Zhang); if the situation is unresolved, consult with • The Program Director/Coordinator (Dr. Emily Lund); if the situation is unresolved, consult with • The Associate Dean for Research (Dr. Emily Lund)

Attendance

The [University Attendance Policy](#) states that "regular and punctual class attendance is essential for academic success and no assigned work is summarily excused because of absence regardless of the cause. Students are permitted to make up work missed because of Official University Absences.

Participation

You are expected to lead and engage in scholarly discussions as well as other class activities.

TCU Online

This course is set up on TCU Online for easy access to course materials, grading, announcements, and communication. Students are expected to monitor and utilize the TCU Online course and submit assignments and materials through the online platform.

Course Schedule

This calendar represents my current plans and objectives. As we go through the semester, those plans may need to change to enhance the class learning opportunities. Such changes will be clearly communicated.

Dates	Topics	Readings	Assignments
Week 1	Introductions – each other, course, assignments, measurement		
Week 2	Measurement Concepts, Constructs, and Variables	DeVallis Chapter 1 and 2	Discussion Due
Week 3	Reliability and Internal Consistency	DeVallis Chapter 3 Assigned Pre-class reading in D2L	Literature Review of Available/ Current Measurement Due 9/11/22 @ 11:59
Week 4	Validity	DeVallis Chapter 4 Assigned Pre-class reading in D2L	
Week 5	Evaluating Existing Tools	DeVallis 257-262 Assigned Pre-class reading in D2L	Discussion Due
Week 6	Evaluating Existing Tools	Assigned Pre-class reading in D2L	
Week7	Evaluating Existing Tools		Appraising Measurement in Published Research Due
Week 8	Scale Development	DeVallis Chapter 5 Assigned Pre-class reading in D2L	Discussion Due
Week 9	Scale Development	Assigned Pre-class reading in D2L	

Week 10	Scale Development Work Day- Peer Review		
Week 11	Factor Analysis	DeVallis Chapter 6 Assigned Pre-class reading in D2L	Discussion Due
Week 12	Scale Development Work Day		
Week 13	Index vs Scale	DeVallis Chapter 7 Assigned Pre-class reading	
Week 14	Presentations of Developed Scale		Scale Development Exercise Due
Week 15	Presentation of Developed Scale		Discussion Due
Week 16	Review and Reflect		Reflection Due

TCU Syllabus Policies & Resources

All TCU policies and resources are available at a link in every D2L course. Alternative ways to access the information are by this [link](#) or scan the QR code with a mobile device camera. Policies and resources provided include support for TCU students, student access and accommodation, anti-discrimination and Title IX information, and other important information.



TCU Mission Statement

To educate individuals to think and act as ethical leaders and responsible citizens in the global community.

PhD in Health Sciences Mission Statement

The mission of this PhD program is to shape the next generation of faculty, scholars, and clinical scientists within the health sciences.

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Outcome(s)	Evaluation Method/ Assignment
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1, 2	Appraising Measurement in Published Research
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