

**Institutional Effectiveness
2022-2023**

Program: Ex Science, Phy Educ and Wellness BS

College and Department: College of Education, Department of Exercise Science

Contact: Christy Killman

Mission:

The mission of the department of Exercise Science is to promote enhanced quality of life (wellness) and strengthen educational pursuits by creating, advancing, communicating, and applying knowledge and skills, through innovative preparation of scholars, researchers, educators, and professionals to meet the needs of a diverse society. (Directly linked to Tech Tomorrow Strategic Goal One – Education for Life; priority actions A, C, D & E. Also linked to Goal Two – Innovation in All We Do; priority actions B and C.)

Mission Brief: Be prepared for service to enhance the quality of life for a diverse society.

Vision: Prepare future professionals to be effective and engaged through clinical-rich and evidenced-based programs.

Attach Curriculum Map (Educational Programs Only): *See Appendix 1.

SLO1: PHYSICAL FITNESS

Define Outcome:

Exercise Science majors will demonstrate health-enhancing levels of fitness by satisfying standardized criteria for muscular strength/muscular endurance, flexibility, cardiorespiratory endurance, leg power, grip strength, and body mass while participating in the annual physical fitness assessment.

Assessment Methods:

Fitness Test once per academic year - The tool used in the administration of this fitness assessment is a nationally normed, proprietary assessment with demonstrated validity and reliability. Each student in Exercise Science must take the fitness test once per academic year - either on the fall rotation or spring rotation. Graduate assistants are test administrators who are supervised by a faculty member and are professionally trained bi-annually on proper test administration protocols for each of the test components. Undergraduate majors who are enrolled in 9 credit hours or more sign up for a section of the test through eagle online. Students enrolled must meet 4 times to satisfy the requirement set forth by the department.

Students complete the PAR-Q (physical activity readiness questionnaire), fill out their personal fit index and walk through demonstration of each test during the first meeting. The second meeting is for practice/questions and to collect body mass data from each student. The third meeting includes administration of all tests except cardiorespiratory endurance and flexibility,

which are administered on the fourth and final day of testing. Each undergraduate student must pass 5 of 6 different tests according to the health enhancing level of fitness criteria. If any student does not satisfy this requirement, the graduate assistant works with the student, providing information and support related to improvement in that area of fitness. Students have multiple opportunities to improve and satisfy the requirements. (Score sheet with national norms attached)

Attached Files *See Appendix 2.

Criteria for Success (Thresholds for Assessment Methods):

Individuals are provided the criteria required for health-enhancing levels of fitness prior to taking the fitness test. As such, the fitness assessment criteria used reflects that level of performance for each of the 6 components being measured. Students are also given a demonstration of the proper way to finish each test (as needed). Two sets of criteria (male and female) are utilized in assessing student fitness.

Health-enhancing levels of physical fitness scores for females:

- Bench press test using 35 lbs/16 reps to the beat of a metronome. {muscular strength/endurance}
- Sit and Reach, which tests flexibility, greater than or equal to 16-inch reach with legs straight.
- Leg Power is tested by vertical jump. Female passing score is 12 inches or higher.
- Grip Strength is measured by a grip dynamometer. Females should score at least 54kg per hand.
- 1.5 mile run measures cardiorespiratory endurance. Females should complete in 18 minutes,30 seconds or less.
- Body composition is measured by bioelectrical impedance which requires student height and weight. Females are good with 16-28% body fat.

Health-enhancing levels of physical fitness scores for males:

- Bench press - 80lbs/20 reps
- Sit and reach - 13 inches minimum
- Leg Power - 16 inches or more
- Grip strength - 84kg per hand
- 1.5 mile run - 14 minutes or less
- Body Composition - 8-22%

Results and Analysis:

During the 2022-2023 academic year, 408 exercise science majors completed the physical fitness test. Results for a randomly selected sample of students [(N=177) 82 from the fall semester and 95 from spring] were examined. When compared to national norms for this age group, the percentage of students in the sample group who “passed” 5 of 6 tests with a health-

enhancing level of fitness was overall high. The chart and table below outline the level of fitness for the sample group.

When compared to data from 2021-2022, student outcomes are similar with highest numbers (and percentages) of students meeting the health-enhancing norms in cardio endurance, flexibility and muscular strength, and falling short of the national norm in grip strength, leg power and body composition. Scores from the sample group indicate high pass rates for health-enhancing levels of fitness.

TABLE 1 Fall 2022

# STUDENTS 82	# PASS	# NOT PASS	% PASS	% NOT PASS
CARDIO ENDURANCE	71	11	87	13
FLEXIBILITY	69	13	84	16
MUSCULAR STRENGTH	79	3	99	1
GRIP STRENGTH	66	16	80	20
LEG POWER	72	10	88	12
BODY COMPOSITION	62	20	76	24

TABLE 2 Spring 2023

# STUDENTS 95	# PASS	# NOT PASS	% PASS	% NOT PASS
CARDIO ENDURANCE	81	14	85	15
FLEXIBILITY	82	13	96	4
MUSCULAR STRENGTH	88	7	93	7
GRIP STRENGTH	70	25	74	26
LEG POWER	84	11	88	12
BODY COMPOSITION	71	24	75	25

TABLE 3 22-23 totals

# STUDENTS [177]	# PASS	# NOT PASS	% PASS	% NOT PASS
CARDIO ENDURANCE	152	25	86	14
FLEXIBILITY	151	26	85	15
MUSCULAR STRENGTH	167	10	94	6
GRIP STRENGTH	136	41	77	23
LEG POWER	156	21	88	12
BODY COMPOSITION	133	44	75	25

Use of Results to Improve Outcomes:

For the 2022-23 academic year graduate assistants were trained and monitored more closely during administration of the fitness tests in both fall and spring semesters. During the spring semester, the schedule was adjusted from 1 day per week for 4 weeks to 2 days per week for 2 weeks, with the same amount of time spent, just over a more condensed time period. The purpose of this change was to help with absenteeism, and it worked. Test takers and test administrators commented on how much better the new schedule was and that schedule is carried over into the 23-24 academic year.

In general, we know that body composition in our testing environment is not 100% accurate, but we continue to measure that because it's an important part of overall physical fitness. Students need to understand that and have a general idea of their own body composition.

In analyzing data from the previous year, we see that potentially, scores vary (too much) depending on who the test administrator is. So, for the 22-23 testing year, GAs were asked to specialize in the test they administered to give a more consistent score for all test takers. This seemed to have helped with the components that require accurate measure by the test administrator.

Having a faculty member on site for testing seems to provide extra support for the test administrators and causes a positive attitude shift in the test takers.

From the 2022-23 testing cycle, we agreed that the number of students being tested per session was too many, so more sections with fewer students is being implemented beginning in the 23-24 testing year.

SLO2: KNOWLEDGE AND UNDERSTANDING OF BASIC RESEARCH

Define Outcome:

Exercise Science students will demonstrate understanding of the basic methods of research by meeting outlined criteria from a teacher created rubric on the final project (key assessment) in EXPW 4730 - Assessment in Exercise Science.

Assessment Methods:

Study design, data collection, analysis and presentation project in EXPW 4730 - Assessment in Exercise Science. For the final key assessment in EXPW 4730, students must apply understanding of basic research concepts working in a small group to design a study, collect data, analyze data and present their projects to peers. All students are 'subjects' of all studies in this class, causing this project to be directly linked to activity of some sort, which causes students to apply knowledge from other courses in their study design and data collection. Class time is provided for data collections by each of the groups. The instructor created rubric

provides guidance for students in preparing and presenting their research. Even though this is a group project, each student is scored individually according to their contribution to and presentation of the research (rubric attached).

Attached Files *See Appendix 3.

Criteria for Success (Thresholds for Assessment Methods):

Students are given the scoring rubric at the onset of the project. The rubric associated with the key assessment project is the guide to success for students. Each area of inclusion is provided with point values assigned. If students use the rubric as a guide, they are likely to perform well in demonstrating their knowledge and understanding of basic research concepts.

The professor goes over the expectations thoroughly in class. Students collaborate on the project from identifying to presenting, but each is scored individually. Students must find articles, collect data, have a solid title and introduction, describe the research method, present the results, address practical implications and conduct themselves in a professional manner while speaking and the visual (power point).

The maximum number of points on the rubric is 50. The usual grading scale is used in a modified form. For example, if 90-100 is an A, then 45 of 50 possible points is an A on this project, and so on.

Results and Analysis:

The results of the research project for students in EXPW 4730-001 and EXPW 4730-002 (Assessment in Exercise Science) in fall 2022 and spring 2023 semesters were examined. On the rubric for the final project (attached) students are scored in six areas with each being broken down with point values attached to each. Students are scored based on individual contribution to the project and the presentation. Results are presented below. From the data, one sees that students are strongest in finding articles related to their research topic and can construct professional and pleasingly aesthetic visuals. They continue to be strong in utilizing APA formatting in their writing. While rubric scores are high in general, students continue to need improvement in defining research methods and presenting results. When compared to the previous academic year, the overall results are very similar, indicating consistency in presentation of materials and student understanding of basic research methods over time.

Table 1

Fall 2022 # 54	Mean on 3.0 scale	Fall 2021 # 37	Mean on 3.0 scale
Articles	2.6	Articles	2.89
Data Collection	1.96	Data Collection	2.08
Title/Intro	2.8	Title/Intro	2.8
Methods	2.06	Methods	1.96

Results	1.93	Results	1.76
Conclusion	2.51	Conclusion	2.47
Aesthetics	2.9	Aesthetics	2.96
APA	2.55	APA	2.51
Overall	2.41	Overall	2.43

Comparing fall '21 to fall '22

Table 2

Spring 2023 # 34	Mean on 3.0 scale	Spring 2022 # 40	Mean on 3.0 scale
Articles	2.84	Articles	2.91
Data Collection	2.6	Data Collection	2.39
Title/Intro	2.77	Title/Intro	2.83
Methods	2.14	Methods	2.00
Results	2.0	Results	1.94
Conclusion	2.31	Conclusion	2.29
Aesthetics	2.86	Aesthetics	2.9
APA	2.70	APA	2.64
Overall	2.53	Overall	2.49

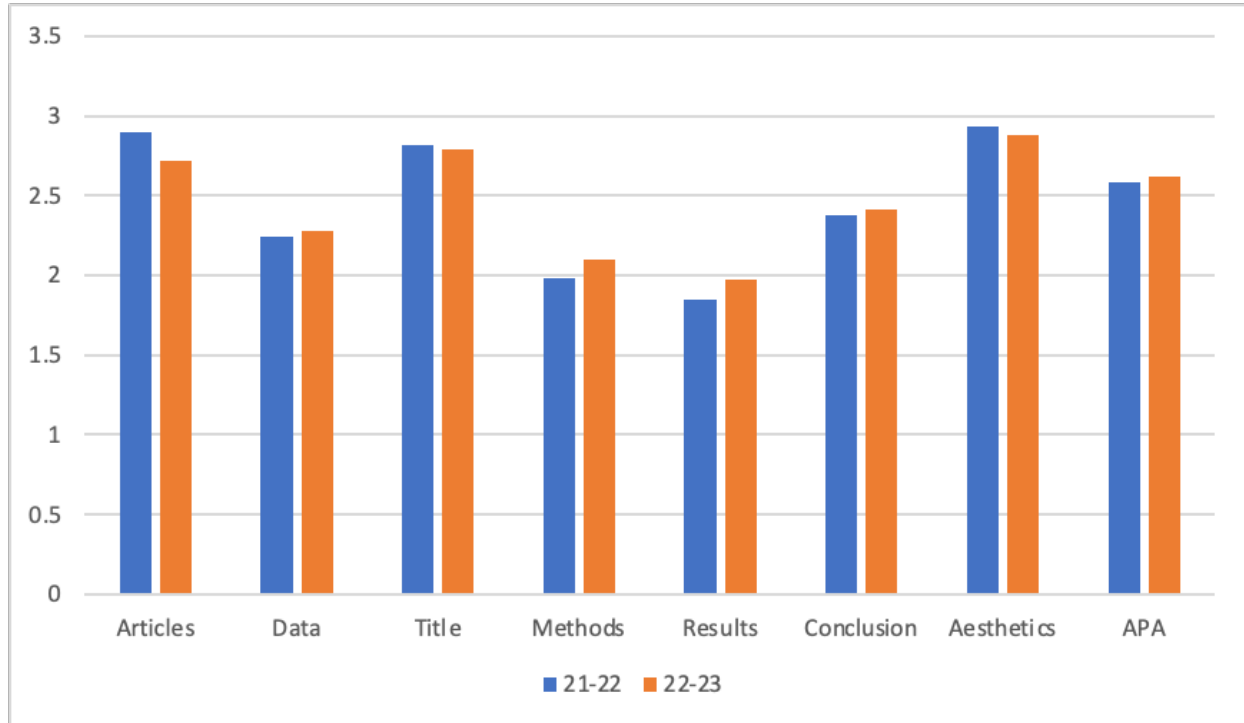
Comparing spring '22 to spring '23

Table 3

22-23 #88	Mean on 3.0 scale	21-22 #77	Mean on 3.0 scale
Articles	2.72	Articles	2.9
Data Collection	2.28	Data Collection	2.24
Title/Intro	2.79	Title/Intro	2.82
Methods	2.1	Methods	1.98
Results	1.97	Results	1.85
Conclusion	2.41	Conclusion	2.38
Aesthetics	2.88	Aesthetics	2.93
APA	2.62	APA	2.58
Overall	2.47	Overall	2.46

Comparing AY 22-23 to AY 21-22

Chart 1 comparing AY 21-22 to AY 22-23 averages



Use of Results to Improve Outcomes:

The instructor of this course made extra effort to explain the rubric to students during the 22-23 year. He also offered to pre-evaluation student projects before the presentation to give feedback as needed for improved student success. Data collection, method and presentation of results improved from the previous year, indicating adjustments worked.

Moving forward, more of the same related to this project, but potentially the instructor will assign groups instead of letting students pick their own groups for the research.

SLO3: KNOWLEDGE OF THE FIELD

Define Outcome:

Exercise Science majors will demonstrate knowledge in the field by answering correctly 80% or more of identified concept questions on the final exam in EXPW 3410 - Motor Development and EXPW 3170 - Motor Learning.

Assessment Methods:

Questions on the final exams in both the identified classes are directly linked to the learning objectives outlined in the course syllabi.

EXPW 3410 and EXPW 3710 include foundational concepts that most classes in Exercise Science depend/build heavily on. These courses have key concepts, ideas or theories that are monumental to understanding development and learning related to motor skills, and mature, efficient movement. On the final cumulative exam in both courses, the key components (directly related to the course objectives) are assessed along with other relevant information for each course. 12-15 questions on the final exam are dedicated to these key components. Students are expected to answer identified questions with 80% or higher accuracy to indicate mastery. (Key questions for both courses and student objectives are attached)

Instructors use Scantron answer sheets, therefore there is nice data related to each test question, but for purposes of this exercise, we look only at the questions identified as being directly linked to one or more of the course objectives. There are at least 2 questions per objective on the final exams.

Criteria for Success (Thresholds for Assessment Methods):

Students will demonstrate their knowledge of the field by answering key identified questions on the final exam in Motor Development and Motor Learning classes with 80% accuracy.

The expectation is for students to score as well as they can on the exams, but for this exercise, 12-15 questions have been identified as benchmarks of understanding for key important concepts in the field of exercise science. The questions are linked to specific learning objectives with the metric of 80% or higher correct answer rate set as the minimum standard.

Results and Analysis:

EXPW 3410 (Motor Development) and EXPW 3170 (Motor Learning) are core courses that provide foundational knowledge that many other courses in exercise science build upon.

The final exam in 3410 – Motor Development presents 14 questions that have been identified as relevant in measuring understanding of and meeting the expectations of six learning objectives listed on the course syllabus. (Objectives with test questions attached). The final exam in 3710 – Motor Learning presents 15 questions that have been identified as relevant in measuring understanding of and meeting expectations of four learning objectives listed on the course syllabus. (Objectives with test questions attached)

Motor Development

During the 2022-23 academic year a total of 82 student took EXPW 3410 in 4 sections. Test papers for the 82 students were examined and answers tallied for each of the 14 questions. Results are presented below. Questions were linked to the corresponding

objective. The number of students and percentage of students who got correct answers per objective is presented below. To be labeled as “passing”, the student had to get all the questions for that objective correct on the exam.

For comparison, data from academic year 21-22 was included.

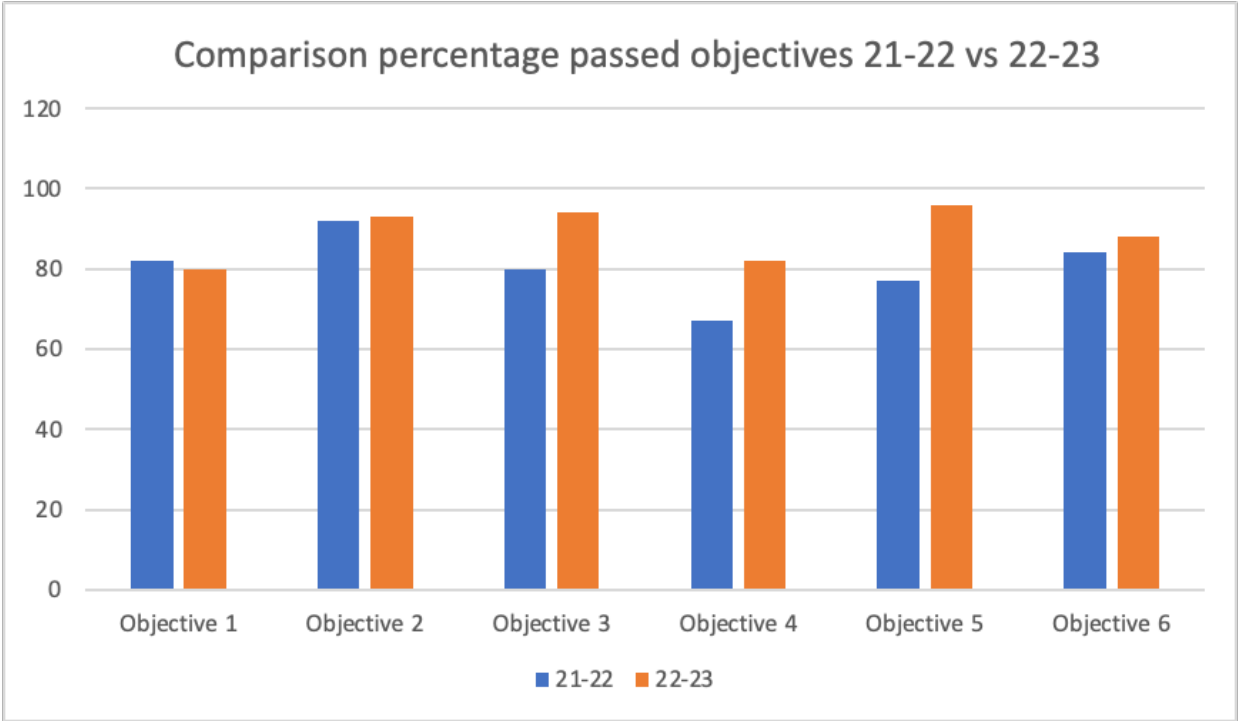
Percentages are rounded up to the nearest whole number.

Table 1 – Academic year 21-22

2021-2022 year [83]	# students passed	Percentage students passed
Objective 1	68	82
Objective 2	76	92
Objective 3	66	80
Objective 4	56	67
Objective 5	64	77
Objective 6	70	84

Table 2 – Academic year 22-23

2022-2023 year [82]	# students passed	Percent students passed
Objective 1	66	80
Objective 2	76	93
Objective 3	77	94
Objective 4	67	82
Objective 5	79	96
Objective 6	72	88



In looking at the comparisons of the 2 years on questions for each of the 6 objectives, one sees that students are coming in about the same or a little higher in gaining content knowledge related to motor development.

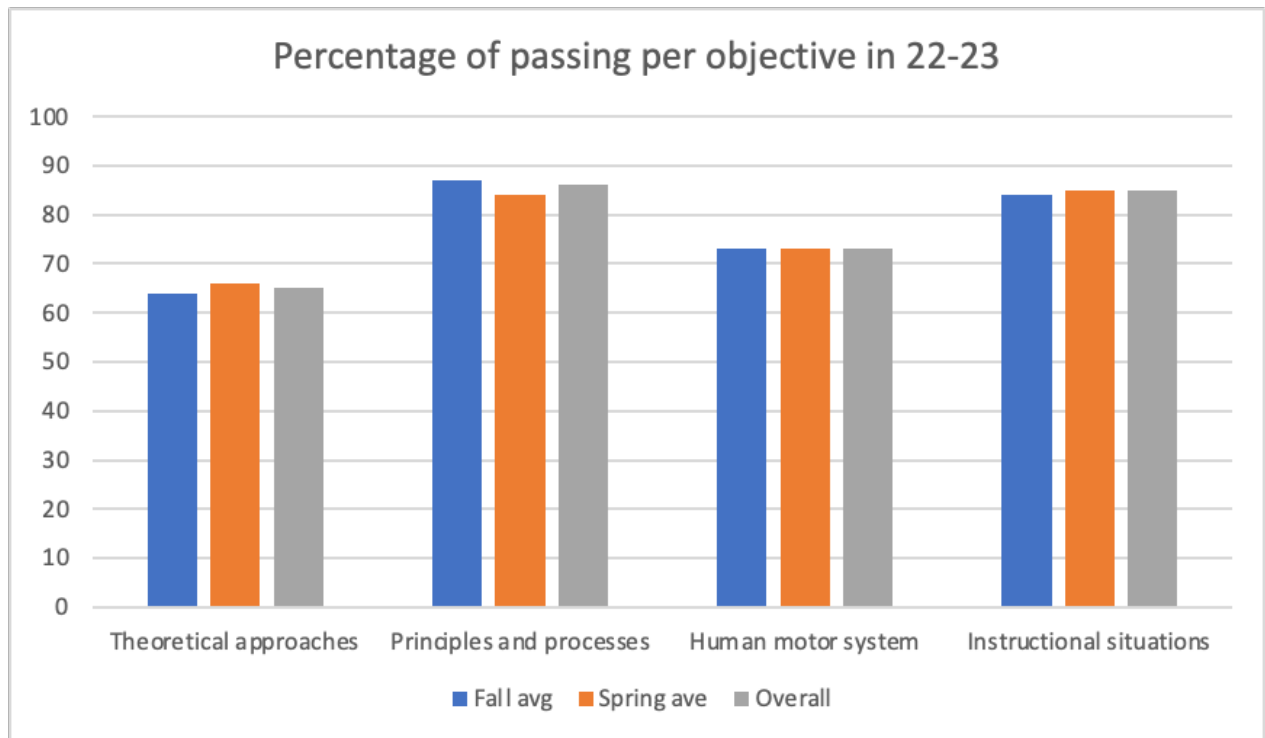
Motor Learning

Most all students who major in exercise science must take EXPW 3170 - Motor Learning in addition to EXPW 3410. Some students from outside the major also take these classes, but the numbers are low in comparison. Prior to the 2022-2023 academic year, data was not kept consistently for the motor learning classes. The tables below show student performance on question from the final exam in 4 sections of EXPW 3170 during the 22-23 year. There are 4 objectives measured (attached) but will be identified as 1. Theoretical approaches, 2. Principles and processes, 3. Human motor behavior, and 4. Instructional situations. Specifically, questions 21,36 and 49 address objective 1. Questions 4,12,14,22 and 25 address objective 2. Questions 19 and 33 address objective 3 and questions 28, 30, 31, 34 and 56 address objective 4. There were 52 students in the courses in the fall semester and 70 in the spring semester for a total of 122 students. All students are considered in the tables below which indicates percentage of students who answered the question correctly on the final exam.

Table 1 – Percentage of correct answers per question in 22-23

	21	36	49	4	12	14	22	25	19	33	28	30	31	34	56
Fall	85	61	45	93	96	93	73	88	79	67	91	94	73	70	94
Spring	88	47	62	97	97	97	56	74	74	71	97	85	68	79	94

Overall	86.5	54	53.5	95	96.5	95	64.5	81	76.5	69	94	89.5	70.5	74.5	94
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Use of Results to Improve Outcomes:

The instructors of this course, in collaboration, offered extra study help to students who were struggling with concepts. GA mentors provided tutoring in the department to students who reached out needing help. Potentially, tutoring and extra help can help students understand concepts. It's not clear how many students took advantage of the offer, especially since percentages from year to year and fall to spring in the respective courses are similar. Extra help and tutoring will continue to be offered to students. Instructors will pair students with tutors upon request.

Summative Evaluation:

For the 3 assessment areas in the undergraduate program (Physical Fitness, Basic Research and Knowledge of the Field) we find that students are performing 'above average' overall. These results are pleasing, but we want to continue to get better, do better and be better in all areas.

For more telling data in the knowledge of the field for this academic cycle, we added an additional class...motor learning. Moving forward, we will add EXPW 4900 - Research Methods to the data collection to paint a better picture of student understanding of research.

Faculty are in the process of evaluating the fitness test during this academic year to initiate better processes, etc. One piece related to this effort includes a student survey to gauge student opinions and thoughts about the fitness test.

Assessment Plan Changes:

We will add EXPW 4900 - Research Methods to our second outcome which is directly related to knowledge and understanding of basic research. The key assessment in that course is different from the 4730 class but also relevant, which will provide better insight into how exercise science majors understand research.

Appendix 1: Curriculum Map, Exercise Science, Physical Education and Wellness BS

Appendix 2: Fitness Test Score Sheet

Appendix 3: EXPW 4730 Presentation Scoring Rubric

Appendix 4: Motor Development Syllabus

Appendix 5: Motor Learning Objectives and Questions

Appendix 1: Curriculum Map, Exercise Science, Physical Education, and Wellness BS

Exercise Science BS

Course	Title	Goals/Learning Outcomes		
		Physical fitness	Research skills	Knowledge of the field
EXPW 1022	INTRODUCTION TO EXERCISE SCIENCE		X	
EXPW 3032	EXERCISE PRESCRIPTION		X	X
EXPW 3410	MOTOR DEVELOPMENT		X	X
EXPW 4032	TRAINING FOR PERFORMANCE	X	X	X
EXPW 4420	KINESIOLOGY	X	X	X
EXPW 4440	EXERCISE PHYSIOLOGY	X	X	X
EXPW 4730	ASSESSMENT IN EXERCISE SCIENCE		X	X
EXPW 4731	ASSESSMENT IN PHYSICAL EDUCATION		X	
EXPW 4810/4820/4830	FIELD EXPERIENCE			X
EXPW 4751/4752	PRACTICUM (SECONDARY/ELEMENTARY)			X
EXPW 4900	RESEARCH METHODS		X	
EXPW 4991	INDEPENDENT STUDY		X	
PHED 1002	PHYSICAL FITNESS TEST	X		

Appendix 2: Fitness Test Score Sheet

Department of Exercise Science, Physical Education & Wellness
Fitness Assessment Record

Name & T# _____ Concentration _____

Test	Criteria	Score	Initialed By	Pass or Fail
YMCA Bench Press Test	M-80lbs/20 reps F-35lbs/16 reps			
Sit and Reach	M-≥ 13 in F- ≥ 16 in			
Leg Power	M- ≥ 16 in F- ≥ 12 in			
Grip Strength	M – 84kg F – 54kg			
Body Composition (BMI and BF%)	M&F < 25 M: 8-22% F: 16-28%			
1.5 Mile Run	M – 14:00 or less F – 18:30 or less			

Date and Time of Test Administration _____

Appendix 3: EXPW 4730 Presentation Scoring Rubric

EXPW 4730 - Presentation Scoring Rubric

Articles – 6 points

- _____ Submit professional articles: (2) Peer Reviewed; (1) Reliability of Instrument(s)
- _____ Submit articles on topic

Data Collection – 6 points

- _____ Provide sufficient practice/warm-up for testing
- _____ Administer tests correctly
- _____ Minimize measurement error

Title/Introduction – 8 points

- _____ Correct research question written as title
- _____ Establish need for study
- _____ Describe what should be expected based on previous articles
- _____ State accurate purpose of the study

Methods – 12 points

- _____ Describe participants
- _____ Report instruments
- _____ Report reliability/validity evidence of instruments
- _____ Describe Procedures accurately (reproducible)
- _____ Identify correct analysis
- _____ Ensure methods match purpose

Results – 6 points

- _____ Report results specific to analysis
- _____ Report results that match purpose
- _____ Provide graph

Conclusion – 6 points

- _____ Discuss practical implications of results
- _____ Report similarities or dissimilarities to other articles
- _____ Report errors in data collection

Aesthetics – 6 points

- _____ Present professional power point (appearance)
- _____ Present solid oral presentation

APA – 6 points

- _____ APA format followed on citations in text
- _____ APA format followed on references

Appendix 4: Motor Development Syllabus

Tennessee Tech University
Exercise Science
3410-001 Motor Development
Fall 2021

Instructor: Christina Tumbow
Credits: 3

Course Description:

The purpose of this course is to understand and document physical, maturational, and developmental changes across the lifespan. Students will be exposed to fundamental movement patterns of children and use assessments to detect motor delays. Content will also address development changes in adulthood and older adulthood.

Required Texts:

Haywood, K. M., & Getchell, N.G., (2020). *Lifespan Motor Development*. (7th Ed.).
Human Kinetics

Objectives of the Course:

By the end of the semester, the student should be able to:

1. Demonstrate knowledge of the developmental process throughout the lifespan.
*Identify prominent researchers who have contributed significantly to our understanding of the developmental process.
2. Discuss the interaction of cognitive and motor development throughout the lifespan.
3. Describe the socialization process and its effect on motor development.
*Identify key points of interaction between motor and moral development.
*Characterize prenatal developmental concerns.
4. Discern the components of basic fundamental movement patterns.
*Report the effects of youth sports on development.
*Assess motor performance in children and adults.
5. List and describe common motor delays and their relationship to motor development.
6. Define health-related fitness and its effect on physiological performance.
*Measure children for appropriate growth and development traits.
*Plan and conduct an effective motor development program for people of any age.

Major Teaching Methods:

This course utilizes lecture, small group discussion techniques, and class activities when applicable. The classroom activities for this course consist of a variety of teaching methods including direct instructional approach (lecture), co-operative learning, individualized instruction, audio-visual presentations, videos, project presentations, and guest presentations. Other techniques including assigned readings, homework assignments, computer exercises may be utilized to learn and apply class material. (Subject to change as necessary)

Topics Covered:

- I An Overview of Development
 - A. Introduction to Motor Development
 - B. Cognitive and Motor Development

Appendix 4: Motor Development Syllabus, cont.

- C. Social and Motor Development
- D. Moral and Motor Development
- II. Factors That Affect Development
 - A. Prenatal Development Concerns
 - B. Effects of Early Stimulation and Deprivation
- III. Physical Changes Across the Lifespan
 - A. Growth and Maturation
 - B. Physiological Changes: Health-Related Physical Fitness
 - C. Movement and the Changing Senses
- IV. Movement Across the Lifespan
 - A. Infant Reflexes and Stereotypies
 - B. Voluntary Movements of Infancy
 - C. Fine Motor Development
 - D. Fundamental Locomotion Skills of Childhood
 - E. Fundamental Object-Control Skills of Childhood
 - F. Youth Sports
 - G. Developmental Motor Delays
 - H. Movement in Adulthood
- V. Assessing Motor Development and Implementing a Program

Grading & Evaluation Procedures:

1. Quizzes (multiple choice, short-answer) and exams (multiple choice) will be used to assess student ability to:
 - a. Describe and differentiate growth, maturation, and development
 - b. Assess growth data
 - c. Assess developmental states of locomotor and manipulative skills
2. Quizzes may be given at the option of the instructor to ensure that all students are reading the assigned materials and are prepared to participate in class discussions. Quizzes may be announced in advance or may be unannounced "pop quizzes".
3. Students will also be evaluated on in-class activities and discussions that will require them to apply concepts from the textbook and/or other reading materials.
4. A motor function assessment project will be used to assess student ability to:
 - a. Measure and evaluate motor functioning of a child, adult, or older adult
5. All grades will be posted on iLearn and kept up-to-date during the semester.
 - a. It is the student's responsibility to review grades on a weekly basis for accuracy.
 - b. The grading scale will not be curved.
6. Mid Term and Final Exam

Appendix 5: Motor Learning Objectives and Questions

Objectives of the Course:

After successfully completing this course, you should be able to do the following:

- Describe the theoretical approaches that drive motor control and learning research.
 - 21, 36,49
- Describe and explain the principles and processes underlying skilled performance.
 - 4, 12, 14, 22, 25
- Illustrate the ways in which the human motor system supports the acquisition and retention of complex movement skills.
 - 19, 33
- Demonstrate how instructional situations can be varied in order to better achieve maximum performance and retention of taught skills.
 - 28, 30, 31, 34, 56