

UNIVERSITY OF WISCONSIN-MILWAUKEE  
Department of Kinesiology

**KIN 330 [online]: Exercise Physiology**

4 credits

5/28/24-7/6/24

**Course Format:** KIN 330 is a fully online, asynchronous course. Material will be presented primarily via course readings, voice over powerpoint “lectures”, YouTube Videos, assignments, and “laboratory experiments”. The laboratory component of this class is designed to serve as a practical extension of class and reading material.

**Instructor:** Ann M. Swartz, PhD, FACSM  
aswartz@uwm.edu  
414-251-5925 (Teams- voice and/or video)

**Office Hours:** As needed. Please email me ([aswartz@uwm.edu](mailto:aswartz@uwm.edu)). I would love to meet with you!

**Course website:** <https://uwm.edu/canvas/home/>

**Canvas Assistance:** <https://uwm.edu/canvas/students/>

**Prerequisites:** Not open to students with credit in KIN 530, KIN 532, or KIN 536. Prereq: KIN 230(P) and satisfaction of GER Quantitative Literacy Part B; or consent of instructor.

**Required Text:** Scott Powers, Edward Howley, John C. Quindry. **CONNECT** for *Exercise Physiology: Theory and Application to Fitness and Performance*. 12<sup>th</sup> Edition, 2024. McGraw Hill. (~\$95)

- For this course, we will be using McGraw-Hill Education Connect® Access for Powers’ Exercise Physiology, 12, 2021. Please make sure you order CONNECT. You have the option of
- Bound edition: ISBN 9781264529810
- Spiral Bound/loose leaf: ISBN 9781266188190
- Ebook: ISBN 9781266201882
- Please follow the steps outlined in “**Connect + Canvas Registration**” to get access to the digital textbook and homework assignments.
- For any and all Technical Support or questions on Connect, **you MUST contact the McGraw-Hill Customer Experience Group directly at (800) 331-5094**. Please save this number and be sure to get your case number for future reference if you call the CXG (Customer Experience) line.

## **Course Description & Objectives:**

Exercise Physiology provides a theoretical basis for understanding the acute and chronic adaptations to exercise through a systems physiology approach. Emphasis will be placed upon the practical application of exercise physiology to the principles of health and fitness.

After successful completion of this course, students will be able to:

1. Describe exercise using the FITT principle.
2. Explain and apply the physiological basis of the major components of physical fitness (cardiorespiratory, body composition, flexibility, muscular strength, muscular endurance), and associated training techniques.
3. Identify the key physiological systems and predict the physiologic responses of these systems before, during and after aerobic and anaerobic exercise.
4. Summarize the physiological adaptations that occur at rest, during sub-max exercise, and maximal exercise, following various training methods (i.e. aerobic, and resistance training).
5. Summarize the factors that may limit and improve exercise performance (e.g., physiological, environmental).
6. Accurately communicate (oral and written) information pertaining to common questions about the body's response to exercise (acute or chronic) using evidence-based sources of information.
7. Identify how acute exercise responses and chronic adaptations to exercise may differ based on age and gender.

The purpose of the laboratory experiences of this class are

1. To become familiar, and gain hands-on experience, with common exercise physiology testing equipment and procedures.
2. To reinforce and compliment material presented in the lecture portion of this class.

## **Technical Competencies**

This course will be conducted 100% online through the Canvas system, and you will need to have the following basic computer competencies to succeed in this and other online courses.

- Have a computer and a stable Internet connection on a regular basis.
- Understand basic computer usage (creating folders/directories, switching between programs, formatting and backing up media, accessing the Internet).
- Able to use a word processing program such as Microsoft Word, presentation programs such as Microsoft PowerPoint, and Spreadsheet programs such as excel to create, edit, analyzed, save, and retrieve information. You can find tutorials in a variety of locations, including the Microsoft Training Page.
- Must be able to use a Web browser to open Web pages, work with PDF files, and search the Internet.
- Must be able to use an e-mail program to send, receive, store, and retrieve messages.
- Must be able to download and install programs (and/or plugins, widgets, etc.) from the Internet.
- Able to utilize browsers supported by Canvas (<https://community.canvaslms.com/t5/Canvas-Basics-Guide/What-are-the-browser-and-computer-requirements-for-Instructure/ta-p/66>).

## **Course Delivery & Schedule**

KIN 330 is divided into six “major modules”: one introductory module and five modules each focused on a different physiologic system (e.g., metabolic, skeletal muscle) or exercise physiology concept (e.g., adaptations, performance). Each major module is divided further into “mini-modules” which focus on relevant topics associated with that particular module. The start and end dates and times for each module will be listed in canvas.

Each of the mini-modules will contain specific learning objectives that you will work toward achieving through careful study of the required readings, Voice-over-PowerPoint slides, short video clips, and laboratory activities. At the end of each major module, you will complete a concept map and an online quiz of your knowledge of that material.

Most required readings are available through the textbook website. Assignment due dates/times are listed in Canvas.

The course schedule may be adjusted per the instructor’s discretion to fit the needs of the class.

Dates	Module/Unit	Tasks <i>(links available in Canvas)</i>	Graded Assignments <i>(due dates available in Canvas)</i>
Opens 5/21	<b>Introduction</b>		
Starts 5/28 Ends 5/29	0.0 Getting Started 1.1 Introduction to course	Video: What is an Exercise Physiologist?	<b>Assignment:</b> Introduce yourself <b>Assignment:</b> Introductory Assignment <b>Lab1:</b> Introduction (includes <b>Connect</b> activities pages 22-29)
Opens 5/28	<b>Metabolism</b>		
Starts 5/30 Ends 6/7	2.0 Introduction to Metabolism	<b>Watch the following videos:</b> Metabolism & Nutrition, Part 1: Crash Course A&P#36 Metabolism & Nutrition, Part 2: Crash Course A&P #37	
	2.1. Cells, Reactions, and Fuels for exercise	<b>Watch the following videos:</b> 1) <i>Enzymes</i> 2) <i>Nutrition Notes: Fuel Sources for Exercise</i> 3) <i>ATP: Adenosine Triphosphate</i>  <b>Watch the following Voice-over- PowerPoint:</b> 1. Fuels for Exercise	<b>Connect</b> activities for pages 48-57
	2.2 Bioenergetics	<b>Watch the following videos:</b> ATP & Respiration: Crash Course Biology #7  <b>Watch the following Voice-over- PowerPoints:</b> 1. Bioenergetics 2. ATP-PC System 3. Glycolysis 4. Citric Acid Cycle 5. Electron Transport Chain 6. ATP Tally 7. Measurement of Aerobic Metabolism	<b>Lab:</b> Power vs. Capacity Lab  <b>Lab:</b> Energy Cost of Walking and Running Lab  <b>Connect</b> Activities pages 57-74, 28-34, 89-90
	2.3 Exercise Metabolism	<b>Watch the following Voice-over- PowerPoints:</b> 1. Metabolism at the Start of Exercise 2. Metabolism at the End of Exercise 3. Metabolism during Exercise 4. Fuel Use during Exercise 5. VO2 max 6. Lactate Threshold	<b>Lab:</b> Oxygen Deficit & EPOC Lab  <b>Assignment:</b> Concept Map  <b>Connect</b> Activities pages 77-88, 91-96  Module 2 <b>Quiz</b>

Opens 6/6	<b>Neuromuscular Structure and Function</b>		
Starts 6/8 Ends 6/14		<p><b>Watch the following videos:</b></p> <ol style="list-style-type: none"> <li>1. Muscles, Part 1 - Muscle Cells: Crash Course A&amp;P #21</li> <li>2. Muscles, Part 2 - Organismal Level: Crash Course A&amp;P #</li> </ol> <p><b>Watch the following <u>optional</u> videos:</b></p> <ol style="list-style-type: none"> <li>1. Muscle</li> <li>2. How do you determine the fiber type of a muscle cell in a living human?</li> <li>3. Kahn Academy: Muscular-skeletal system physiology</li> </ol>	
	3.1 Neuromuscular Structure and Function	<p><b>Watch the following Voice-over- PowerPoints:</b></p> <ol style="list-style-type: none"> <li>1. Skeletal Muscle Function and Structure</li> <li>2. Skeletal Muscle Fiber Contraction</li> </ol>	<b>Connect</b> Activities pages 152-161, 164-166, 173-174, 179-189
	3.2 Muscle Fiber Types	<p><b>Watch the following Voice-over- PowerPoints:</b></p> <ol style="list-style-type: none"> <li>1. Skeletal Muscle Fiber Types</li> </ol>	<b>Connect</b> Activities pages 164-166 and 193-97
	3.3 Muscle Action	<p><b>Watch the following Voice-over- PowerPoints:</b></p> <ol style="list-style-type: none"> <li>1. Types of Muscle Contraction</li> <li>2. Force Development and Regulation</li> </ol>	<p><b>Lab:</b> Force-Velocity Lab</p> <p><b>Connect</b> Activities pages 198-203</p>
	3.4 Impediments to Muscle Function	<p><b>Watch the following Voice-over- PowerPoints:</b></p> <ol style="list-style-type: none"> <li>1. Fatigue Preview the document</li> <li>2. Muscle Soreness Preview the document</li> </ol>	<p><b>Lab:</b> Muscle Fatigue Lab</p> <p><b>Assignment:</b> Neuromuscular Unit Concept Map</p> <p><b>Connect</b> Activities pages 190-193 and 489-495</p> <p>Module 3 <b>Quiz</b></p>
Opens 6/12	<b>Cardiovascular</b>		
Starts 6/15 Ends 6/21		<p><b>Watch the following videos:</b></p> <p>Anatomy &amp; physiology of the circulatory system</p> <p>Khan Academy</p> <ul style="list-style-type: none"> <li>• Meet the heart!</li> <li>• Circulatory system and the heart</li> </ul>	

	4.1 Cardiovascular Structure and Function	<p><b>Watch the following Voice-over- PowerPoints:</b>  Structure of the Cardiovascular System</p> <ol style="list-style-type: none"> <li>1. Electrocardiogram</li> <li>2. Cardiac Output</li> <li>3. Heart Rate</li> <li>4. Stroke Volume</li> <li>5. Blood Pressure</li> <li>6. Blood Flow</li> </ol>	<b>Connect</b> Activities pages 208-227
	4.2 Cardiovascular Responses to Exercise	<p><b>Watch the following videos:</b></p> <ol style="list-style-type: none"> <li>1. Cardiovascular System Responses to Exercise</li> <li>2. Cardiovascular System continued</li> </ol> <p><b>Watch the following Voice-over- PowerPoints:</b></p> <ol style="list-style-type: none"> <li>1. Introduction to cardiovascular responses to exercise</li> <li>2. Cardiovascular responses to incremental exercise</li> <li>3. Cardiovascular responses to intermittent exercise</li> <li>4. Cardiovascular responses to prolonged exercise</li> <li>5. Cardiovascular responses to dynamic resistance exercise</li> <li>6. Cardiovascular responses to static exercise</li> </ol>	<p><b>Lab:</b> Cardiovascular Responses to Exercise Lab</p> <p><b>Connect</b> Activities pages 227-236</p>
	Temperature	<p><b>Watch the following videos:</b></p> <ol style="list-style-type: none"> <li>1. Exercise Thermoregulation Part 1 of 3</li> <li>2. Exercise Thermoregulation Part 2 of 3</li> <li>3. Exercise Thermoregulation Part 3 of 3</li> </ol>	<p><b>Connect</b> Activities Ch 12, 595-604</p> <p><b>Assignment:</b> Cardiovascular Unit Concept Map  Module 4 <b>Quiz</b></p>
Opens 6/19	<b>Pulmonary</b>		
Starts 6/22 Ends 6/28		<p><b>Watch the following videos:</b></p> <ol style="list-style-type: none"> <li>1. The Lungs and Pulmonary System</li> </ol>	
	5.1 Structure and Function of the Pulmonary System	<p><b>Watch the following videos:</b></p> <ol style="list-style-type: none"> <li>1. Pulmonary Exercise Physiology Part 1 of 3</li> <li>2. Pulmonary Exercise Physiology Part 2 of 3</li> <li>3. Pulmonary Exercise Physiology Part 3 of 3</li> </ol> <p><b>Watch the following <u>optional</u> videos:</b>  “Advanced respiratory system physiology”.</p>	<b>Connect</b> Activities pages 241-259

	5.2 Pulmonary Responses to Exercise	<b>Watch the following Voice-over- PowerPoints:</b> <ol style="list-style-type: none"> <li>1. Respiration during exercise</li> <li>2. Pulmonary responses to short-term, light-moderate intensity exercise</li> <li>3. Pulmonary responses to prolonged exercise</li> <li>4. Pulmonary responses to incremental exercise</li> <li>5. Pulmonary responses to static exercise</li> </ol>	<b>Lab:</b> Pulmonary Responses to Exercise  <b>Connect</b> Activities pages 259-269
	Acid Base Balance	<b>Watch the following Voice-over- PowerPoints:</b> <ol style="list-style-type: none"> <li>1. Acid Base Balance</li> </ol>	<b>Connect</b> Activities Ch 11
	Altitude	<b>Watch the following videos:</b> <ol style="list-style-type: none"> <li>1. How does it feel to climb Mt. Everest?</li> <li>2. Altitude and Exercise</li> </ol>	<b>Connect</b> Activities Pg 586-594  <b>Assignment:</b> Pulmonary Unit Concept Map  Module 5 Quiz
Opens 6/26	<b>Physiology of Training</b>		
Starts 6/29 Ends 7/6	6.1. Aerobic Exercise	<b>Watch the following videos:</b> Principles of Training Cardiovascular System continued Pulmonary Exercise Physiology Part 3 of 3.  <b>Watch the following Voice-over- PowerPoints:</b> <ol style="list-style-type: none"> <li>1. Metabolic Adaptations to Aerobic Exercise</li> <li>2. Central Cardiovascular Adaptations to Aerobic Exercise</li> <li>3. Peripheral Cardiovascular Adaptations to Aerobic Exercise</li> <li>4. Pulmonary Adaptations to Aerobic Exercise</li> <li>5. Neuromuscular Adaptations to Aerobic Exercise</li> <li>6. The Impact of Aerobic Training on VO2max</li> <li>7. The Impact of Aerobic Training on Lactate Threshold</li> <li>8. Tapering and Detraining</li> <li>9. Adaptations to Anaerobic Exercise</li> </ol>	<b>Lab:</b> VO2 max Lab Activity  <b>Connect</b> Activities Ch 13
	6.2. Resistance Training	<b>Watch the following videos:</b> Adaptations to Strength Training What Makes Muscle Grow	<b>Connect</b> Activities Ch 14

		<p><b>Watch the following Voice-over- PowerPoints:</b></p> <ol style="list-style-type: none"> <li>1. Metabolic Adaptations to Resistance Training</li> <li>2. Cardiovascular Adaptations to Resistance Training</li> <li>3. Muscular Adaptations to Resistance Training</li> <li>4. Neural Adaptations to Resistance Training</li> <li>5. Hyperplasia</li> <li>6. Hypertrophy</li> <li>7. Role of Endocrine System in Adaptations to Resistance Training</li> <li>8. Role of Nutrition in Adaptations to Resistance Training</li> </ol>	
	6.3. Factors Affecting Performance	<p><b>Watch the following Voice-over- PowerPoints:</b></p> <ol style="list-style-type: none"> <li>1. Factors Affecting Performance- Introduction</li> <li>2. Factors Affecting Performance-Fatigue</li> <li>3. Factors Affecting Anaerobic Performance</li> <li>4. Factors Affecting Aerobic Performance</li> </ol>	<p><b>Connect</b> Activities Ch 19</p> <p><b>Assignment:</b> Concept Map</p> <p>Module 6 <b>Quiz</b></p>

\*Schedule is subject to change. There is NO final exam.



## Grading & Evaluation:

### Connect/SmartBook2.0 Activities (10% of final grade)

Connect activities include readings and questions to answer. These can be found on the mini-module workbooks in Canvas, the assignments page in canvas, or the Book website

### Assignments (25% of final grade)

You will be required to complete assignments throughout the semester. These assignments may include (but are not limited to) posting to a discussion board, responding to questions, or completing a concept map.

### Labs (25% of final grade)

You will be required to complete laboratory activities throughout the semester. These lab activities may include (but are not limited to) performing physical activity or exercise, analyzing data, and/or answering questions.

### Quizzes (40% of final grade)

Quizzes will include material from text, lecture, class discussion, assignments, and laboratory activities. You will have the opportunity to take the quizzes two times, the average of your two scores will be recorded. Note, questions are taken from a question bank, so it is unlikely that you will receive the same questions twice.

Undergraduate Student Evaluation	Percent of Final Grade
Quizzes	40
Assignments	25
Labs	25
Connect Activities	10
<b>TOTAL</b>	<b>100%</b>

Letter Grade	Percent	Letter Grade	Percent
A	92.0 - 100%	C	72.0- 77.99%
A-	90.0 – 91.99%	C-	70.0 - 71.99%
B+	88.0 – 89.99%	D+	68.0 – 69.99%
B	82.0 – 87.99%	D	62.0 – 67.99%
B-	80.0 – 81.99%	D-	60.0 – 61.99%
C+	78.0 – 79.99%	F	<59.99%

***Please note- Assessments receiving letter grades in the “C” range are considered acceptable and meet minimum requirements. To earn an “A” in this class, you must submit work that is outstanding relative to the level of achievement necessary to meet the course requirements.***

## Course, Department and College Policies:

1. Graded activities due dates and late submissions. Due dates are posted within Canvas and in this document. Late work is not accepted, therefore make sure to check the due date and time. Technical problems close to the deadlines will not be cause for acceptance of late work. Please do not wait until the last minute to submit your work. It is your responsibility to ensure that all of your graded activities are successfully submitted via Canvas. For example, make sure that all quiz items are saved and submitted, and double check that submissions are correct and complete. I will permit a single, one-time "life happens", where you can submit one assignment, lab or quiz late, no questions asked.

In case of an emergency, for example major illness or a death in the family, official documentation will need to be provided.

2. Student responsibility/technical difficulties policy. Because this course is now 100% online, you are responsible for being able to access course materials on a consistent and regular basis and completing basic technical tasks like uploading documents and installing plug-ins needed for watching videos.

Technical or computer problems do not negate required coursework including completion of assigned tasks and submission of graded activities. If your computer or tablet breaks, you have network problems, etc., you still are responsible for submitting your graded activities on time.

To access assistance with Canvas, please visit "get help" on the FAQ page <https://uwm.edu/canvas/students/?target=fags>. Canvas provides 24 hour/7 day per week support for students.

3. Communication.
  - Course announcements. The Canvas Announcements feature located on the KIN 330 Canvas homepage will be used to communicate course-related announcements... be sure to check this on a consistent basis.
  - E-mail. If you have questions or concerns, please email Dr. Swartz. In general, emails will be answered within 24 business hours of receipt. There may be times when I am unable to respond to emails within this timeframe – if that is the case, I will use an automated response to indicate when you can expect a response. Please keep this timeframe in mind and do not wait until the last minute to ask questions about course graded activities.
4. BS Kinesiology Handbook. Students are encouraged to review the BS Kinesiology Handbook of Policies and Procedures, <https://uwm.edu/publichealth/academics/bs-kinesiology/>. This resource offers students information regarding admission requirements and University policy regarding classroom accommodation, complaint procedures, and grade and grievance procedures.
5. College of Health Sciences/Zilber College of Public Health Honor Code. Students are encouraged to view the College of Health Sciences Honor Code, at: <https://uwm.edu/healthsciences/students/honor-code/>
6. No incompletes will be given without consulting the instructor before the last day of class. The UWM policy on incompletes can be found at: <https://catalog.uwm.edu/policies/undergraduate-policies/#academicpolicies>

## Special Accommodation

If you need special arrangements in order to meet any of the class requirements, please see the instructor as soon as possible, preferably in advance. Any student requiring special accommodations should contact the Student Accessibility Center (Mitchell Hall) to obtain documentation, and provide such documentation to the instructor. Students will be allowed to complete requirements affected by religious observances.

### University Policies:

**Time Investment:** UWM has a credit hour policy. This document identifies the time students need to invest in a course to be successful. Students are expected to invest a minimum of 48 hours per semester per credit hour of the course. Therefore, this four-credit course consists of at least 192 hours of time spent on the course over the entire 6-week semester. Students should anticipate devoting at least 30 hours of work per week to complete the readings, assignments, laboratories, quizzes and exams. [Here is a website with more details and suggested syllabus Workload statements.](#)

**UWM Syllabus link:** You must include a link to the [Secretary of the University's Syllabus Links website](#) which contains a list of syllabus links to policies pertaining to students with disabilities, absences due to religious observation, students called to active military duty, incompletes, discriminatory conduct, Title IX, academic misconduct, complain procedures, grade appeal procedures, LGBT+ resources, and final exam policies. The entire document of syllabus links need not be included (though you may do so if you like), but consider including a bulleted list of some of the items, such as:

- If you need special accommodations to meet any of the course, please contact me as soon as possible (and visit [The Accessibility Resource Center](#)).
- Students will be allowed to complete examinations or other requirements that are missed because of a religious observance or call to active military duty.

**Academic Integrity Policy\*:** Include information on what is expected behavior for using and citing the work of others. Providing examples of what is and is not acceptable behavior helps students understand and follow the policy. Here is additional UWM [information on academic misconduct](#). Moreover, for online courses, see [CETL's tips on academic integrity in online learning for instructors and students](#).

**Statement on the use of Artificial Intelligence Engines in completing course assignments\*:** Include an explicit statement that explains what AI use is and is not allowed in this class, as well as how AI use should be cited. See the [CETL page on AI](#), which includes information, sample syllabus statements and resources. It is also important to talk with students about this policy as you discuss assignment expectations.

**Department Policies (if applicable):** If your department has special policies on class cancellations, incompletes, etc. please list them here.

## *UWM RESOURCES FOR STUDENTS\**

### Support U

Any student in need, or students that face challenges that are barriers to their education, are encouraged to contact the Dean of Students ([dos@uwm.edu](mailto:dos@uwm.edu)) for support. Support U offers wrap-around holistic support for students, including basic needs, accessing the food pantry, emergency funding, case management, and connecting to resources, etc. Support U is run by the Dean of Students Office.

Also see UWM's [Mental Health Resources website](#)

**Tutoring / the Writing Center!**

If the SSC or your department offers tutoring for your course, please list details on the syllabus and encourage students to seek help before falling behind. It is helpful to normalize using tutoring by explaining that these services are for all students and often the difference between a B grade and an A grade is taking advantage of campus resources.

If your class involves writing, include encouragement along the following lines:

Students are encouraged to take advantage of free one-on-one consultations from [The Writing Center](#)

**For online learners:** If the class is online, consider including the following:

Students are encouraged to review [CETL's tips on how to be a successful online student](#)

**More Student Resources:**

See [CETL List of Student Resources](#) and the [Dean of Students List of Student Resources](#)

**I realize reading this syllabus from beginning to end makes the course look daunting! Please know that I are aware of how much I am asking from you. Even so, I believe each of you can succeed in this course, but that will require you to work hard and reach out when you need help. If there is anything can do to help you succeed in the course, please do not hesitate to reach out!**