

Tompkins Cortland Community College

Master Course Syllabus

Course Discipline and Number: RECR 232

Year: 2023-2024

Course Title: Exercise Physiology

Credit Hours: 3

I. Course Description: This course covers the acute physiological responses and chronic adaptations to exercise including scientific evaluation of neuromuscular, metabolic, and cardiovascular, hormonal, and respiratory systems as they pertain to the human mechanism as a whole, and acute and chronic exercise. Substantial outside preparation is required in addition to class meetings. Prerequisites: MATH 095 or MATH 098 and RDNG 116 if required by placement testing; ENGL 100; prior completion of, or concurrent enrollment in, BIOL 131 or BIOL 201. 3 Cr. (2 Lec, 1 Lab). Spring semester.

II. Additional Course Information:

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| 1. An understanding of how the body responds to acute and chronic exercise is crucial for the physical educator, athletic trainer, coach, fitness expert, or exercise physiologist. Students will gain an understanding and working knowledge of how the body responds to exercise so that they may apply this knowledge to their chosen field. |
| 2. Students will be utilizing the Tompkins Cortland Fitness Center for lab exercises. |
| 3. Prior completion of, or concurrent enrollment in, BIOL 132 or BIOL 202 is recommended. |

III. Student Learning Outcomes

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

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| 1. Explain how muscles work and how they adapt to training, and nutrition's role in energy production. |
| 2. Explain oxygen consumption and fatigue and their relation to performance. |
| 3. Explain how to design effective programs based on the primary components of Physical Activity. |
| 4. Explain the implications of training in adverse conditions including temperature and altitude. |
| 5. Explain how to effectively train special populations including children and older adults as well as for athletic competition. |

IV. Tompkins Cortland Institutional Learning Outcomes; Program Learning Outcomes; SUNY General Education Outcomes

Tompkins Cortland ILOs N/A

Complete this section for "service" courses only (e.g. courses that are required of all students; courses that are not program specific but satisfy liberal arts requirements; or commonly used in multiple academic programs to meet non-program-specific requirements). Check only Institutional Learning Outcomes (ILOs) that are meaningfully developed and assessed in this course. For each ILO chosen, include the SLO to which it aligns.

Students will:

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- ☐ Communicate effectively, in oral and written forms, taking into consideration audience and purpose.
- ☐ Apply principles and methods of scientific inquiry and quantitative reasoning appropriate to their discipline.
- ☐ Use information, critical thinking, and the creative process to solve problems and reach conclusions.
- ☐ Use technology appropriate to their discipline.
- ☐ Describe the ways in which social, economic, or environmental sustainability depends on their own and the collective contributions of a diversity of ideas and people.

Program Learning Outcomes

Complete this section for program-specific courses (e.g. those that share the same 4 letter designation as the academic program or satisfy requirements in related programs). List the academic program(s) here and note which Student Learning Outcomes align to specific Programmatic Learning Outcomes. Please see the MCS Instructions for more details.

Specify the Academic Program

Recreation: Exercise Studies

PLO - design, implement, lead, analyze and evaluate services that facilitate targeted human experiences, recreation, and leisure requirements using technology and equipment appropriate for the leisure experience.
SLOs
1. Explain how muscles work and how they adapt to training and nutrition's role in energy production.
2. Explain oxygen consumption and fatigue and their relation to performance.
3. Explain how to design effective programs based on the primary components of Physical Activity.
4. Explain the implications of training in adverse conditions including temperature and altitude.
5. Explain how to effectively train special populations including children and older adults as well as for athletic competition.

SUNY General Education Outcomes N/A

If this course **assesses** a SUNY GEN ED Outcome, check all that apply and indicate which course outcome(s) address each checked item:

☐ CRITICAL THINKING - Students will:

- a. identify, analyze, and evaluate arguments as they occur in their own or others' work; and
- b. develop well-reasoned arguments.

☐ INFORMATION MANAGEMENT - Students will:

- a. perform the basic operations of personal computer use;
- b. understand and use basic research techniques; and
- c. locate, evaluate and synthesize information from a variety of sources.

☐ GENERAL EDUCATION CATEGORY - Area(s):

For courses that are approved to meet one (or more) of the ten SUNY General Education categories, indicate which category the course fulfills, and which outcome(s) are aligned with the SUNY outcomes for that category:

☐ This course does not address any of the above Tompkins Cortland ILOs, PLOs, or SUNY General Education Outcomes.

V. Essential Topics/Themes

1. History and overview of exercise physiology
2. Skeletal muscle physiology
3. Neurological control of movement
4. Neuromuscular adaptations to resistance exercise
5. Metabolism and basic energy systems
6. Hormonal regulation of exercise
7. Metabolic adaptations to training
8. Health anatomy/function and cardiovascular control during exercise
9. Respiratory regulation during exercise
10. Cardiovascular and respiratory adaptations to training
11. Exercise in different environments - thermoregulation and exercise
12. Excessive training, over training, tapering and detraining
13. Ergogenic aids, nutrition and performance
14. Body Composition and sports
15. Impact of development, aging, gender and overweight children on exercise
16. Energetics: Adenosine Triphosphate and transfer of chemical energy, stored fuels, rest and exercise

VI. Methods of Assessment/Evaluation

Method	% Course Grade
1. Written tests and quizzes	20-40%
2. Lab exercises and attendance	20-40%
3. Projects	20-40%
4. Written Reports and Case Studies	10-30%
NOTE: The course instructor, with approval of the program chair, can make changes to evaluation methods.	

VII. Texts – ☒ Required ☐ Recommended ☐ Used for more than one course (list courses)

1. Murray, B., Kenney, W. L. <i>Practical Guide to Exercise Physiology</i> . 1 st ed., 2016. Human Kinetics. ISBN-13 : 978-1450461801
2. Other text books required/suggested by nationally recognized Personal Trainer Certification Agency

Editions listed are current as of date of syllabus. More recent editions may be used.

VIII. Bibliography of Supplemental Materials

1. McArdle, W., Katch, F. and Katch, V. (2006) <i>Essentials of Exercise Physiology</i> . 3rd ed. Lippincott, Williams and Williams. Baltimore, MD
2. Scott K Powers, Edward T Howley, (2009) <i>Exercise Physiology: Theory and Application to Fitness and Performance</i> , 7th Edition. McGraw Hill, New York, NY ISBN-13 9780073376479
3. Delavier, Frederic. <i>Strength Training Anatomy</i> . 3rd ed., 2010. Human Kinetics, Champaign, IL. ISBN-13: 9780736092265
4. Delavier, Frederic. <i>Women's Strength Training Anatomy</i> . 1 st ed., 2002. Human Kinetics, Champaign, IL. ISBN-13: 9780736048132
5. Kathleen Haywood, Nancy Getchell (2009) <i>Life Span Motor Development</i> -5th Edition. Human Kinetics, Champaign, IL ISBN-13: 9780736075527
6. Arnold Nelson, Jouko Kokkonen (2007). <i>Stretching Anatomy</i> . Human Kinetics, Champaign, IL ISBN-13: 9780736059725
7. American College of Sports Medicine. <i>ACSM Fitness Book</i> . 3rd ed., 2003. Human Kinetics, Champaign, IL ISBN-13: 9780736044066
8. Rahl, Riva. <i>Physical Activity and Health Guidelines eBook Recommendations for Various Ages, Fitness Levels, and Conditions from 57 Authoritative Sources</i> . 2010. Human Kinetics, Champaign, IL. ISBN-13: 9781450408882
9. Sandler, David. <i>Fundamental Weight Training</i> . 2010. Human Kinetics, Champaign, IL. ISBN-13: 9780736082808
10. NSCA -National Strength & Conditioning Association, Lee Brown editor. <i>Strength Training</i> . (eBook) 2 nd ed., 2007. Human Kinetics, Champaign, IL. ISBN-13: 9780736084949
11. Westcott, W., Baechle, T.R. <i>Strength Training Past 50</i> . (eBook) 2 nd ed., 2007. Human Kinetics, Champaign, IL. ISBN-13: 9780736082129
12. Stoppani, J. <i>Encyclopedia of Muscle & Strength</i> . 2006. Human Kinetics, Champaign, IL ISBN-13: 9780736057714
13. Fitzsimmons, S. and L. L. Buettner. <i>Health Promotion for the Mind, Body, and Spirit</i> . 2006. Venture Publishing, State College, PA. 978-1-892132-63-5
14. Payne, L., Ainsworth, B. and G. Godbey <i>Leisure, Health, and Wellness: Making the Connections</i> . 2010. Venture Publishing, State College, PA 978-1-892132-89-5
15. Hamilton, N., Weimar, W., and K. Luttgens. (2008) <i>Kinesiology: Scientific Basis of Human Motion</i> . 11th Edition, 2008. McGraw Hill, New York, NY. ISBN-13 9780072972979
16. Hall, S. J. <i>Basic Biomechanics</i> , 5th Edition, 2007. McGraw Hill, New York, NY ISBN-13 9780073044811
17. Beam, W.C., Adams, G. M. <i>Exercise Physiology Laboratory Manual</i> . 6th Edition, 2011. McGraw Hill, New York, NY N-13 9780073376592
18. Nieman, D.C. <i>Exercise Testing & Prescription</i> , 7th Edition, 2011. McGraw Hill, New York, NY. ISBN-13 9780073376486
19. V. Gregory Payne, Larry D. Isaacs, (2008) <i>Human Motor Development: A Lifespan Approach</i> , 7th Edition. McGraw Hill, New York, NY. ISBN-13 9780073523620
20. Thomas D. Fahey (2010). <i>Basic Weight Training for Men and Women</i> , 7th Edition. McGraw Hill, New York, NY. ISBN-13 9780073376585
21. Mark Vella (2008). <i>Women's Guide to Strength and Anatomy Training</i> , 1st Edition. McGraw Hill, New York, NY. ISBN-13 9780071495721
22. American Council on Exercise (2010). <i>Ace Personal Trainer manual</i> , 4 th ed. Bryant, Cx & Green, DJ (Eds.) San Diego, CA
23. American Council on Exercise (2010). <i>ACE's Essentials of Exercise Science for Fitness Professional</i> . Bryant, Cx & Green, DJ (Eds.) San Diego, CA
24. American Council on Exercise (2010). <i>Master the Manual</i> , 4 th Ed. Bryant, Cx & Green, DJ (Eds.) San Diego, CA
25. American College of Sports Medicine (2009) <i>ACSM's Guidelines for Exercise Testing and Prescription</i> , 8th edition ISBN-13: 978-0-7817-6903-7
26. American College of Sports Medicine (2009) <i>ACSM's Resources for the Personal Trainer</i> , 3rd edition ISBN-13: 978-0-7817-9772-6
27. American College of Sports Medicine (2009) <i>ACSM's Certification Review</i> , 3rd. edition ISBN-13: 978-0-7817-6901-3

28. Journals and Publications:

- JOPERD--The Journal of Physical Education, Recreation & Dance
- **Human Movement Science**, Elsevier B.V.
- Journal of Applied Biomechanics
- Journal of Exercise Physiology
- Physical and Health Education Journal
- Strength and Conditioning Journal

Editions listed are current as of date of syllabus. More recent editions may be used.

IX. Other Learning Resources

Audiovisual:

Various videos pertaining to exercise

Electronic:

None specified

Other:

Use of the TC3 Fitness Center for Lab Exercises.

Attendance Policy: *To maintain good grades, regular attendance in class is necessary. Absence from class is considered a serious matter and absence never excuses a student from class work. It is the responsibility of all instructors to distribute reasonable attendance policies in writing during the first week of class. Students are required to comply with the attendance policy set by each of their instructors. Students are not penalized if they are unable to attend classes or participate in exams on particular days because of religious beliefs, in accordance with Chapter 161, Section 224-a of the Education Law of the State of New York. Students who plan to be absent from classroom activity for religious reasons should discuss the absence in advance with their instructors. See college catalog for more information.*

Services for Students with Disabilities: *It is the College's policy to provide, on an individual basis, appropriate academic adjustments for students with disabilities, which may affect their ability to fully participate in program or course activities or to meet course requirements. Students with disabilities should contact the Coordinator of Access and Equity Services, to discuss their particular need for academic adjustments. All course materials are available in alternate formats upon request.*

Academic Integrity: *Every student at Tompkins Cortland Community College is expected to act in an academically honest fashion in all aspects of his or her academic work: in writing papers and reports, in taking examinations, in performing laboratory experiments and reporting the results, in clinical and cooperative learning experiences, and in attending to paperwork such as registration forms.*

Any written work submitted by a student must be his or her own. If the student uses the words or ideas of someone else, he or she must cite the source by such means as a footnote. Our guiding principle is that any honest evaluation of a student's performance must be based on that student's work. Any action taken by a student that would result in misrepresentation of someone else's work or actions as the student's own — such as cheating on a test, submitting for credit a paper written by another person, or forging an advisor's signature — is intellectually dishonest and deserving of censure.

Several degree programs offer student learning opportunities (such as internships, field work, and clinical experiences) outside the standard classroom setting. As part of the learning process, students must understand and engage in conduct that adheres to principles guiding employment within the professional workplace. These behaviors include, but are not limited to, academic integrity, accountability, reliability, respect, use of appropriate language and dress, civility, professional ethics, honesty, and trustworthiness. Disciplinary action may be initiated for inappropriate conduct occurring while participating in any course-related project or event.