

**UCC/UGC/ECCC**

Proposal for Course Change

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| **FAST TRACK (Select if this will** **be a fast track item. Refer to** [**UCC**](http://www4.nau.edu/avpaa/UCCPolicy/FastTrack.docx) **or** [**UGC**](http://www.nau.edu/gradcol/UGC/UGC_FastTrack_Policy&Process.pdf) **Fast Track Policy for eligibility)** |

# *If the changes included in this proposal are significant, attach copies of original and proposed syllabi in* [*approved university format*](http://www4.nau.edu/avpaa/UCCForms/syllabus.doc)*.*

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| 1. Course subject and number: | **BIO 465C** | 2. Units: | **3** |

[**See upper and lower division undergraduate course definitions**](http://www4.nau.edu/avpaa/UCCPolicy/Uplow.doc).

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| 3. College: | CEFNS | 4. Academic Unit: | Biological Sciences |

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| 5. Current Student Learning Outcomes of the course.   * Understand and identify a normal hemodynamic exercise response to incremental exercise * Gain competence in clinical exercise physiology techniques including resting and exercise blood pressure and heart rate measurement, ECG preparation and interpretation, graded exercise testing and indirect calorimetry. * List and explain the principle reasons for conducting a graded exercise test * Understand the pathophysiology of clinical clientele, contraindications for exercise testing and different conditions affect exercise performance. * Prepare and present a clinical presentation on a pathophysiologic topic using peer-reviewed ‘evidence-based’ literature | Show the proposed changes in this column (if applicable). Bold the proposed changes in this column to differentiate from what is not changing, and Bold with strikethrough what is being deleted. *(*[*Resources & Examples for Developing Course Learning Outcomes*](http://www4.nau.edu/avpaa/Assessment/CourseLearningOutcomesPDF_090712.pdf)*)*     * **~~Understand and identify a normal hemodynamic exercise response to incremental exercise~~** * **~~Gain competence in clinical exercise physiology techniques including resting and exercise blood pressure and heart rate measurement, ECG preparation and interpretation, graded exercise testing and indirect calorimetry.~~** * **~~List and explain the principle reasons for conducting a graded exercise test~~** * **~~Understand the pathophysiology of clinical clientele, contraindications for exercise testing and different conditions affect exercise performance.~~** * **~~Prepare and present a clinical presentation on a pathophysiologic topic using peer-reviewed ‘evidence-based’ literature~~**  1. **Students will explore topics in depth within the field of clinical exercise physiology and expand understanding of pathophysiology and pathogenesis of chronic conditions that can potentially be modulated by exercise.** 2. **Students will be able to critically evaluate and interpret current literature in clinical exercise physiology and have knowledge of recent developments in therapeutic strategies.** 3. **Students will be able to use evidence-based approach when making recommendations, whether for prevention or treatment of chronic diseases.** 4. **Students will understand the scientific method and be able to communicate scientific information effectively, analyze and interpret scientific data, access and interrogate primary scientific literature.** 5. **Students will be able to synthesize material from across human biological sub-disciplines and apply to this course.** |

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| 6. Current **title,** **description** and **units**. Cut and paste, in its entirety,from the current on-line academic catalog\* [**http://catalog.nau.edu/Catalog/**](http://catalog.nau.edu/Catalog/).  **BIO 465C ADVANCED CLINICAL EXERCISE SCIENCE (3)**  Description: Advanced clinical exercise testing and prescription, relative to diseases of the cardiovascular, pulmonary, metabolic, musculoskeletal, neuromuscular, and immunologic systems. Special attention given to exercise assessment techniques. 2 hrs. lecture, 2 hrs. lab. Letter grade only. Course fee required.  Units: 3  Requirement Designation: Senior Capstone  Prerequisite: BIO 201 and BIO 202 and (EXS 336 or BIO 338) and (EXS 460 or BIO 460) | Show the proposed changes in this column **Bold** the proposed changes in this column to differentiate from what is not changing, and **~~Bold with strikethrough~~**what is being deleted.  **BIO 465C ADVANCED CLINICAL EXERCISE SCIENCE (3)**  Description: **~~Advanced clinical exercise testing and prescription, relative to diseases of the cardiovascular, pulmonary, metabolic, musculoskeletal, neuromuscular, and immunologic systems. Special attention given to exercise assessment techniques. 2 hrs. lecture, 2 hrs. lab~~**. **This course will cover pathogenesis and pathophysiology of chronic diseases such as diabetes, cardiovascular disease, Alzheimer’s disease and focus on current research related to interventions including exercise, nutrition, nutritional supplements, and pharmacological therapies. Additionally the topics of aging, obesity, chronic inflammation, and oxidative stress will be addressed.** Letter grade only. Course fee required.  Units: 3  Requirement Designation: Senior Capstone  Prerequisite: BIO 201 and BIO 202 and **~~(EXS 336 or~~** BIO 338**~~) and (EXS 460 or BIO 460)~~** |

\*if there has been a previously approved UCC/UGC/ECCC change since the last catalog year, please copy the approved text from the proposal form into this field.

7. Justification for course change.

**The proposed changes are intended to update a course that has not been taught since 2010. Course content is not necessarily changing but being updated to better reflect current subject matter. In addition, it is proposed to remove BIO 460 as a prerequisite since the course material no longer relies on having prior background in Exercise Testing and Prescription.**

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| 8. Effective **BEGINNING** of what term and year? | **Fall 2014** |
| [**See effective dates calendar**](http://www4.nau.edu/avpaa/timelines/1213Effective.xls). |  |

**IN THE FOLLOWING SECTION, COMPLETE ONLY WHAT IS CHANGING**

|  |  |
| --- | --- |
| **CURRENT** | **PROPOSED** |
| Current course subject and number: | Proposed course subject and number: |
| Current number of units: | Proposed number of units: |
| Current short course title: | Proposed short course title (max 30 characters): |
| Current long course title: | Proposed long course title (max 100 characters): |
| Current grading option:  letter grade  pass/fail  or both | Proposed grading option:  letter grade  pass/fail  or both |
| Current repeat for additional units: | Proposed repeat for additional units: |
| Current max number of units: | Proposed max number of units: |
| Current prerequisite:  BIO 201 and BIO 202 and (EXS 336 or BIO 338) and (EXS 460 or BIO 460) | Proposed prerequisite (include rationale in the justification):  **BIO 201, BIO 202, BIO 338** |
| Current co-requisite: | Proposed co-requisite (include rationale in the justification): |
| Current co-convene with: | Proposed co-convene with: |
| Current cross list with: | Proposed cross list with: |

9. Is this course in any plan (major, minor, or certificate) or sub plan (emphasis)?

Yes  No

If yes, describe the impact and include a letter of response from each impacted academic unit.

**Exercise Science; BS (elective), Biomedical Science; BS (elective). There is no impact outside of the program or Department.**

10. Is there a related plan or sub plan change proposal being submitted? Yes  No

If no, explain.

**This proposed course description and prerequisite change will not require related plan changes.**

11. Does this course include combined lecture and lab components?                  Yes  No

If yes, include the units specific to each component in the course description above.

**Answer 12-15 for UCC/ECCC only:**

12. Is this course an approved Liberal Studies or Diversity course?                    Yes  No         If yes, select all that apply.   Liberal Studies    Diversity    Both

13. Do you want to remove the Liberal Studies or Diversity designation?            Yes  No

If yes, select all that apply.   Liberal Studies    Diversity     Both

14. Is this course listed in the [**Course Equivalency Guide**](https://aztransmac2.asu.edu/cgi-bin/WebObjects/Admin_CEG.woa/wa/ByInst?inst=NAU)?                               Yes  No

15. Is this course a [**Shared Unique Numbering**](https://aztransmac1.asu.edu/cgi-bin/WebObjects/ATASS.woa/wa/SUNList?S=X) (SUN) course?                            Yes  No

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| **FLAGSTAFF MOUNTAIN CAMPUS** |  |
| **Scott Galland** | **10/21/2013** |
| Reviewed by Curriculum Process Associate | Date |
|  |  |
| **Approvals**: |  |
|  | 12-18-13 |
| Department Chair/Unit Head (if appropriate) | Date |
|  |  |
| Chair of college curriculum committee | Date |
|  |  |
| Dean of college | Date |
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| **For Committee use only:** |  |
|  |  |
| UCC/UGC Approval | Date |

Approved as submitted: Yes  No

Approved as modified: Yes  No

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| **EXTENDED CAMPUSES** |  |
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| Reviewed by Curriculum Process Associate | Date |
|  |  |
| **Approvals:** |  |
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| Academic Unit Head | Date |
|  | |
| Division Curriculum Committee (Yuma, Yavapai, or Personalized Learning) | Date |
|  | |
| Division Administrator in Extended Campuses (Yuma, Yavapai, or Personalized Learning) | Date |
|  | |
| Faculty Chair of Extended Campuses Curriculum Committee (Yuma, Yavapai, or Personalized Learning) | Date |
|  | |
| Chief Academic Officer; Extended Campuses (or Designee) | Date |
|  |  |

Approved as submitted: Yes  No

Approved as modified: Yes  No

**CURRENT SYLLABUS**

College of Engineering and Natural Science,

Department of Biological Sciences

**BIO 465C: Advanced Clinical Exercise Science, Spring 2010**

Instructor: Dr. J Christopher Baldi

Office, Phone: Peterson 201; 523-0883

Office Hours: By appointment anytime.

Email: [chris.baldi@nau.edu](mailto:chris.baldi@nau.edu)

Meeting time: T Th 8:00 – 9:15

Course Prerequisite: BIO 201, BIO 202, (EXS 336 or DIO 338), (EXS 460 or BIO 460)

**Texts (not required)**:

American College of Sports Medicine. Guidelines for Exercise Testing and Prescription. 7th ed. Lippincott Williams & Wilkins, 2006.

Thaler MS. The Only EKG book you’ll ever need. 5th ed. Lippincott Williams & Wilkins.

**Course Structure**:

This is a theoretical and practical course. Because the primary objectives of the course are centered on developing proficiency in clinical exercise physiology, lectures may be combined with practical laboratory application. This will often require students to exercise in class, sometimes at high or maximal intensities. For this reason, students may need to come dressed and prepared to serve as subjects for each lab as arranged. Another component of the class will be assisting in firefighter testing.

**Course objectives**:

* Understand and identify a normal hemodynamic exercise response to incremental exercise
* Gain competence in clinical exercise physiology techniques including resting and exercise blood pressure and heart rate measurement, ECG preparation and interpretation, graded exercise testing and indirect calorimetry.
* List and explain the principle reasons for conducting a graded exercise test
* Understand the pathophysiology of clinical clientele, contraindications for exercise testing and different conditions affect exercise performance.
* Prepare and present a clinical presentation on a pathophysiologic topic using peer-reviewed ‘evidence-based’ literature

**Evaluation**:

*Written Examinations (100 points)*: There will be one written examination during the semester. The exam will include short answer and essay questions on material covered to that date. Students are expected to take exams at the designated time unless prior arrangements have been made. There will be no exceptions to this rule unless under extenuating circumstances (documentation for all emergencies will be required).

*Critical evaluation assignment* (*100 points*): Students will select a two-page (single spaced) paper (preferably related to their research paper topic) and critically evaluate the science of the paper. This page limit does not include references or figures and tables WHICH ARE ENCOURAGED. Write the title at the top of page 1 with your name underneath it in bold font. DO NOT include a title page. This will require the student to carefully read the whole paper and evaluate the quality of the science and findings. This will involve extensive *additional* reading (not just the paper in question). A guideline sheet is provided which outlines the expectations of this assignment. In addition, Dr. Baldi will critically evaluate a paper during the first week of class to help establish the expectations of this assignment. If a student is unhappy with his/her grade, they are encouraged to evaluate a second paper, with the opportunity to earn half of their demerited points back (e.g. if you got a 70% first time, you can do another paper and earn 15 (30/2) points for the second assignment). ANY GRAMMATICAL ERROR WILL COUNT AS 5 POINTS OFF.

*Written research paper (100 points)*: Students will be required to prepare a 3-page (single spaced, 11 font or larger) document relative to topics related to the pathophysiology of coronary artery disease, congestive heart failure, diabetes or pulmonary disease. This page limit does not include references or figures and tables WHICH ARE ENCOURAGED. Write the title at the top of page 1 with your name underneath it in bold font. DO NOT include a title page. Your topic must be selected from those provided below *or* must be approved by Dr. Baldi. You are encouraged to start early and consult Dr. Baldi throughout the semester. Do not spend time on epidemiology or definitions of the disease (I will do this in class). You may receive ONE edits of your writing from me for work handed in **prior to March 13, 2011**, but not later. Papers handed in late will lose 10% of the total grade per day late NO EXCEPTIONS.

Congestive Heart Failure:

Systolic heart failure: causes and clinical consequences

Diastolic heart failure: "

Neurohumoral influences of heart failure

Natriuretic peptides: function and clinical relevance

Pulmonary morbidities associated with heart failure

Pulmonary disease and right heart failure

Diabetes:

Hyperglycemic microangiopathy

Diabetic cardiomyopathy

Diabetic nephropathy: causes and consequences

Diabetic neuropathy: "

Diabetic changes in pulmonary function

Hypertension: the influences of diabetes

Pulmonary disease:

To be determined.

Rules:

* Only professional, peer-reviewed references are allowed. This does not include Wikipedia or anything like it.
* A minimum of 10 references (as described above) are required for this assignment. You should be prepared to answer a question on **any** reference you list.
* The two references you feel are most relevant to your topic must be handed in with your paper.
* Each grammatical error will discount your grade (written assignment) by 5%. This includes (but is not limited to) spelling, verb-noun agreement, typographical errors and incorrect referencing.
* Any plagiarism will result in a zero for the assignment. If you have questions, see: **www1.chapman.edu/wilkinson/socsci/sociology/Faculty/Babbie/plag00.html**
* Only one quotation is allowed per paper.
* Two figures (or tables) are required for each written assignment. More are strongly encouraged. Each figure or table should include a legend that describes for the reader the data presented.

*Presentations* (*100 points*): Presentations will be conducted at regular class time during the last two weeks of class. Each student will give a 15-minute power point presentation with 5 minutes provided at the end of each talk for questions. Topical (e.g. diabetes) presentations will be presented together (e.g. we will not alternate between diseases). A grading sheet will be provided to describe grading criteria, however your general aim should be to help a group of educated lay people to understand your topic. On the day of your presentation, and just prior to your talk, you will be required to provide two questions to the class which they should be able to answer after listening to your talk. Part of your grade will be based on how well I am able to answer your questions after your talk! These questions must be approved by Dr. Baldi prior to your talk. NOTE: The presentations will be STRICTLY limited to 15 minutes. It is acceptable to finish prior to 15 minutes (not by much), but you will be cut-off if you exceed 15 minutes! Suggestions to improve your oral presentation are available at any time.

Final grades will be based on a total of 400 points.

*Extra points*: CERF testing: During the semester, there will be opportunities to assist in contracted testing of Flagstaff Fire Department staff. Testing dates will be announced in class, and students who have shown proficiency in testing methods may volunteer to assist in the testing. Up to 10 points are available based on student performance during testing. If you are interested, please inform Dr. Baldi in advance of any testing date. There are no other opportunities for 'extra credit'.

**Encouraged web sites**:

<http://medstat.med.utah.edu/kw/ecg>

<http://www.12leadecg.com/intro/>

<http://www.utmem.edu/cardiology/edu-ecg.php>

<http://cvphysiol.com>

**Lecture topics**:

**Week Topic and Activities/Readings:**

Jan 18 – 20 Introduction to course. Referencing, Critical evaluation of

Medical literature

Jan 25 - 27 CV anatomy, physiology and hemodynamics:

(*Resting and exercise blood pressures*)

**RESEARCH PAPER SELECTION DUE JAN. 27**

Feb 1 – 3 CV physiology and pathophysiology

*(Bruce and other protocols; arterial BP)*

Feb 8 – 10 Hypertension, Congestive heart failure (CHF),

transplant, pacemakers (*Exercise EKG testing*)

**CRITICAL EVALUATION ASSIGNMENT DUE FEB. 10**

Feb 15 – 17 Acute cardiovascular events. Coronary artery disease

**SECOND CHANCE CRITICAL EVALUATION DUE FEB. 17**

Feb 22 – 24 Basic EKG prep and interpretation (*EKG prep and interpretation*)

Mar 1 - 3 EKG: Arrhythmias and conduction blocks, Ischemia an infarction (*Exercise testing*)

Mar 8 - 10 Cardiovascular medications

(*Maximal aerobic capacity testing*)

Mar 15 - 17 SPRING BREAK

Mar 22 – 24 Diabetes/Obesity

Mar 29 Diabetes and co-morbidities

Mar 31 No class

**RESEARCH PAPER ASSIGNMENT DUE MARCH 31**

Apr 5 - 7 Pulmonary disease

Apr 12 - 14 **EXAM**/Catch up

Apr 19 - 21 Presentations

Apr 26 - 28 Presentations

May 3 - 5 Presentations

May ? **NO FINAL**

**PROPOSED SYLLABUS**:

CEFNS: Department of Biological Sciences

BIO 465C/599 – Advanced Clinical Exercise Physiology (3 credits)

TUE 2:00-4:30pm, SLF 101

**Instructor: Tinna Traustadóttir, Ph.D.**

**E-mail:** tinna.traustadottir@nau.edu

**Office, Phone:** Peterson Hall (Bldg 22) Room 205, 523-7291

**Office hours:** Monday 2:00-3:00pm, Wednesday 10:30-11:30am, or by appointment

**Prerequisites:** BIO 201, BIO 202, BIO 338

**Required Text:**

The requiredreading for this class will consist entirely of articles from scientific journals. These will be

made available on BlackBoard.

**Course Description:**

This course will cover pathogenesis and pathophysiology of chronic diseases such as diabetes, cardiovascular disease, Alzheimer’s disease and focus on current research related to interventions including exercise, nutrition, nutritional supplements, and pharmacological therapies. Additionally the topics of aging, obesity, chronic inflammation, and oxidative stress will be addressed.

**Student Learning Expectations/Outcomes for this course:**

1. Students will explore topics in depth within the field of clinical exercise physiology and expand understanding of pathophysiology and pathogenesis of chronic conditions that can potentially be modulated by exercise.
2. Students will be able to critically evaluate and interpret current literature in clinical exercise physiology and have knowledge of recent developments in therapeutic strategies.
3. Students will be able to use evidence-based approach when making recommendations, whether for prevention or treatment of chronic diseases.
4. Students will understand the scientific method and be able to communicate scientific information effectively, analyze and interpret scientific data, access and interrogate primary scientific literature.
5. Students will be able to synthesize material from across human biological sub-disciplines and apply to this course.

**Course Structure and Approach:**

The class meets once a week (2.5 hrs.) and will involve lectures, group work, discussions, and students’ presentations about selected topics. Students are expected to attend class and participate in these discussions. The class relies heavily on independent reading, research synthesis, and data interpretation.

**Course Outline:**

1. **Reading** - Reading consists of review articles, and published research studies.
2. **Exams** - There will be 2 written exams during the course; a mid-term and a final comprehensive exam at the end of the course.
3. **Capstone Project** – Each student will write a paper focused on a specific research question related to efficacy of a particular intervention. The research question must have professor’s approval. The project is designed around answering the question using current research literature. The student will present the results in class and turn in a written report.
4. **Assignments –** There will be multiple assignments throughout the course, both individual and group projects. Some of those will be homework assignments and other will be done in class.

**Assessment of Student Learning Outcomes:**

Assignments 100 points

Midterm Exam 100 points

Final Exam 100 points

Capstone Project 100 points

**TOTAL 400 points**

**Grading System:**

A = 90-100%

B = 80-89%

C = 70-79%

D = 60-69%

F < 60%

**Course policy**

Students are expected to do the work of class, including all tests, readings, and assignments. **Tardiness disrupts the instructor and other students. You are expected to be on time for class. Please turn off all electronic communication devices during class.**

Make-up exams will be given only in cases of institutional excuses or documented medical excuses and must be taken within one week of the scheduled date of the exam. Unless previously cleared with the instructor, all assignments must be completed and submitted on or before the due date. Late assignments will receive a grade of zero points.

Cheating on exams or plagiarism will result in a grade of zero points for that assignment.

NAU has asked that several policy statements be included on each syllabus. These statements concern Safe Environment Policy, Students with Disabilities, Institutional Review Board, and Academic Integrity. These statements should be read and understood by each student. For that reason, a copy is posted on the University web site at:

<http://www2.nau.edu/academicadmin/UCCPolicy/plcystmt.html>

The class schedule on the following page is subject to change if necessary; however, the exam dates will not change.

Reminder: the last day to drop/add/delete a class is Sep 9

BIO 465C/599 – Advanced Clinical Exercise Physiology

**Tentative Class schedule**

**1. Sep 3** Introduction

**2. Sep 10** Aging (cardiovascular function)

**3. Sep 17** Aging (muscular function)

**4. Sep 24** Obesity/Inflammation/Oxidative Stress

**5. Oct 1** Caloric Restriction

**6. Oct 8** Diabetes andDiabetes-related Interventions

**7. Oct 15 Mid-Term Exam**

**8. Oct 22** Rapamycin, Resveratrol, & Antioxidants

**9. Oct 29** Cardiovascular Disease & CVD-related Interventions

**10. Nov 5** Cardiovascular Disease & CVD-related Interventions

**11. Nov 12** Cognition andAlzheimer’s Disease **- Capstone Papers Due**

**12. Nov 19 Capstone Presentations** I

**13. Nov 26 Capstone Presentations** II

**14. Dec 3** Preventive Medicine: What do we recommend?

**15. Dec 10 Final Exam**