New Course Request

Indiana University

Indianapolis Campus

Check Appropriate Boxes: Undergraduate credit [ ] Graduate credit [x] Professional credit [ ]

1. School/Division Medicine/Graduate
2. Academic Subject Code GRAD
3. Course Number GE30 (must be cleared with University Enrollment Services)
4. Instructor J. Tune, PhD
5. Course Title Advanced Cardiovascular Physiology

Recommended Abbreviation (Optional) (Limited to 32 Characters including spaces)

6. First time this course is to be offered (Semester/Year): Fall 2009
7. Credit Hours: Fixed at [3] or Variable from [ ] to [ ]
8. Is this course to be graded S-F (only)? Yes [ ] No [x]
9. Is variable title approval being requested? Yes [ ] No [x]
10. Course description (not to exceed 50 words) for Bulletin publication: Advanced (3cr hr) study of the cardiovascular system using contemporary methods is emphasized. Concepts of cardiovascular structure, function, hemodynamics, excitation-contraction coupling, signal transduction and electrophysiology are reinforced. The format of the course will include faculty lectures and facilitated interactive student discussion.

11. Lecture Contact Hours: Fixed at [39] or Variable from [ ] to [ ]
12. Non-Lecture Contact Hours: Fixed at [9] or Variable from [ ] to [ ]
13. Estimated enrollment: [5] of which [100] percent are expected to be graduate students.
14. Frequency of scheduling: Bi-annually Will this course be required for majors? No
15. Justification for new course: An elective module in the curriculum of new TBMG PROGRAM
16. Are the necessary reading materials currently available in the appropriate library? Yes
17. Please append a complete outline of the proposed course, and indicate instructor (if known), textbooks, and other materials.
18. If this course overlaps with existing courses, please explain with which courses it overlaps and whether this overlap is necessary, desirable, or unimportant.
19. A copy of every new course proposal must be submitted to departments, schools, or divisions in which there may be overlap of the new course with existing courses or areas of strong concern, with instructions that they send comments directly to the originating Curriculum Committee. Please append a list of departments, schools, or divisions thus consulted.

Submitted by: Michael Sturch Date 6/1/09
Department Chairman/Division Director

Approved by: [Signature]
Date 6/1/09
Dean

Chancellor/Vice-President
Date

University Enrollment Services
Date

After School/Division approval, forward the last copy (without attachments) to University Enrollment Services for initial processing, and the remaining four copies and attachments to the Campus Chancellor or Vice-President.

UPS 724 University Enrollment Services Final—White; Chancellor/Vice-President—Blue; School/Division—Yellow; Department/Division—Pink; University Enrollment Services Advance—White
Advanced Cardiovascular Physiology, G830, Johnathan Tune

I. HEADER
Advanced Cardiovascular Physiology
Course Number:  G830
Course Director:  Johnathan Tune
Prerequisites:  Cardiovascular, Renal and Respiratory Function (G735) or consent of instructor.

II. COURSE DESCRIPTION AND RATIONALE
Advanced (3 credit hour) study of the physiology, pharmacology, and pathophysiology of the cardiovascular system using contemporary methods is emphasized. Concepts of cardiovascular structure, function, hemodynamics, excitation-contraction coupling, signal transduction and electrophysiology are reinforced. The format of the course will include faculty lectures and facilitated interactive student discussion (3 hours/week).

III. EDUCATIONAL OBJECTIVES
At the completion of this course the students will:

1. Understand basic structure, energetics and functional mechanics of cardiac muscle.
2. Understand cardiac signaling and cytoskeletal regulation.
3. Outline mechanisms of cardiac excitation-contraction coupling.
4. Understand cardiac energy utilization and regulation of contractile performance.
5. Understand cardiac electrophysiology, electrocardiogram and arrhythmias.
6. Understand integrative regulation of coronary blood flow.
8. Understand the mechanisms of coronary artery disease and cardiac ischemia.
9. Understand the mechanisms of collateral growth and angiogenesis.
10. Understand the pathophysiologic mechanisms of heart failure.

IV. COURSE CONTENT

<table>
<thead>
<tr>
<th>WEEK</th>
<th>SUBJECT</th>
<th>READING</th>
<th>FACULTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Structure and energetics of cardiac muscle</td>
<td>Katz: Chapters 1-2</td>
<td>Tune</td>
</tr>
<tr>
<td>2</td>
<td>Contractile proteins and cytoskeleton</td>
<td>Katz: Chapters 4-5</td>
<td>Tune/Gallagher</td>
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<tr>
<td>3</td>
<td>Cardiac signal transduction: functional &amp; proliferative</td>
<td>Katz: Chapters 8-9</td>
<td>Herring/Gallagher</td>
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<td>4</td>
<td>Cardiac E-C coupling and performance</td>
<td>Katz: Chapters 7, 10</td>
<td>Sturek/Tune</td>
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<tr>
<td>5</td>
<td>Cardiac energy utilization and mechanics</td>
<td>Katz: Chapters 3, 6</td>
<td>Tune</td>
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<tr>
<td>6</td>
<td>Examination 1</td>
<td></td>
<td></td>
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<tr>
<td>7</td>
<td>Cardiac ion channels and action potential</td>
<td>Katz: Chapters 13-14</td>
<td>Sturek</td>
</tr>
<tr>
<td>8</td>
<td>Cardiac electrocardiogram and arrhythmias</td>
<td>Katz: Chapters 15-16</td>
<td>Tune</td>
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<tr>
<td>9</td>
<td>Coronary circulation</td>
<td>Physiology 88:1009-1046, 2008</td>
<td>Tune</td>
</tr>
<tr>
<td>10</td>
<td>The heart as a pump</td>
<td>Katz: Chapters 11-12</td>
<td>Tune</td>
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<tr>
<td>11</td>
<td>Examination 2</td>
<td></td>
<td></td>
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<tr>
<td>12</td>
<td>Cardiovascular hemodynamics &amp; exercise</td>
<td>TBA</td>
<td>Tune</td>
</tr>
<tr>
<td>13</td>
<td>Coronary artery disease &amp; the ischemic heart</td>
<td>Katz: Chapter 17</td>
<td>Sturek/Tune</td>
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<tr>
<td>14</td>
<td>Angiogenesis/collateral growth</td>
<td>TBA</td>
<td>Unthank/Miller</td>
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<tr>
<td>15</td>
<td>Heart failure</td>
<td>Katz: Chapter 18</td>
<td>Tune</td>
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V. REQUIRED AND RECOMMENDED TEXTS
The students are required to have Physiology of the Heart, 4th Edition by A. M. Katz, Lippincott Williams and Wilkins, 2006. Additional original research papers and selected review articles may be assigned by faculty.
VI. EVALUATION AND GRADING

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>WEIGHT</th>
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<tbody>
<tr>
<td>Discussion</td>
<td>Interactive discussion to demonstrate critical thinking about concepts</td>
</tr>
<tr>
<td>Examinations</td>
<td>Score on three written exams</td>
</tr>
</tbody>
</table>

Grading Scale:

<table>
<thead>
<tr>
<th>Letter grade</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>A</td>
<td>93-100</td>
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<tr>
<td>A-</td>
<td>90-92.99</td>
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<tr>
<td>B+</td>
<td>87-89.99</td>
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<tr>
<td>B</td>
<td>75-86.99</td>
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<tr>
<td>C</td>
<td>60-74.99</td>
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<tr>
<td>D</td>
<td>50-59.99</td>
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<tr>
<td>F</td>
<td>&lt;50</td>
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VII. BIBLIOGRAPHY


VIII. CHEATING AND PLAGIARISM

Students are instructed to make themselves aware of University regulations concerning plagiarism, the maintenance of academic honesty and the definitions of unacceptable behavior and cheating. Academic misconduct of any sort will not be tolerated and will be dealt with as outlined in the IU/IUPUI Code of Student Rights, Responsibilities, and Conduct, which can be viewed at: http://www.iupui.edu/code/

Examples of misconduct include but are not limited to:

1. Cheating
   A student must not use or attempt to use unauthorized assistance, materials, information, or study aids in any academic exercise

2. Fabrication
   A student must not falsify or invent any information or data in an academic exercise including, but not limited to, records or reports, laboratory results, and citations to the sources of information.

3. Plagiarism
   A student must not adopt or reproduce ideas, words, or statements of another person without appropriate acknowledgment. A student must give credit to the originality of others and acknowledge an indebtedness whenever he or she does any of the following:
   a. Quotes another person’s actual words, either oral or written
   b. Paraphrases another person’s words, either oral or written
   c. Uses another person’s idea, opinion, or theory; or
   d. Borrows facts, statistics, or other illustrative material, unless the information is common knowledge.

4. Interference
   a. A student must not steal, change, destroy, or impede another student’s work.
   b. A student must not give or offer a bribe, promise favors, or make threats with the intention of affecting a grade or the evaluation of academic performance.

Potential consequences for academic misconduct:

If the instructor has information that one of his/her students committed an act of academic misconduct, the faculty member will hold an informal conference with the student. The conference will be prompt and private. If the faculty member concludes that the student is responsible for the misconduct, then the faculty member will impose an appropriate academic sanction (i.e., lower or failing grade on the assignment, assessing a lower or failing grade for the course).
IX. AMERICANS WITH DISABILITIES ACT:
If you need any special accommodations due to a disability, please contact Adaptive Educational Services at (317)-274-3241.