APPLICATION FOR NEW COURSE

1.	Sub	mitted by the College of Date:
	Dep	partment/Division proposing course:
2.	Proj	posed designation and Bulletin description of this course:
	a.	Prefix and Number
	b.	Title [*]
		*If title is longer than 24 characters, write a sensible title (24 characters or less) for use on transcripts:
	c.	Courses must be described by <u>at least one</u> of the categories below. Include the number of <u>actual contact hours per week</u> for each category, as applicable.
	(_) CLINICAL () COLLOQUIUM () DISCUSSION () LABORATORY () LECTURE
	(_) INDEPEND. STUDY () PRACTICUM () RECITATION () RESEARCH () RESIDENCY
	_) SEMINAR () STUDIO () OTHER – Please explain:
	d.	Please choose a grading system: Letter (A, B, C, etc.) Pass/Fail
	e.	Number of credit hours:
	f.	Is this course repeatable? YES NO If YES, maximum number of credit hours:
	g.	Course description:
	h.	Prerequisite(s), if any:
	i.	Will this course be offered through Distance Learning? YES NO If YES, please circle one of the methods below that reflects how the majority of the course content will be delivered:
		Internet/Web- Interactive based video Extended campus Kentucky Educational Television (KET/teleweb) Other
		Please describe "Other":
3.	Tea	ching method: N/A or Community-Based Experience Service Learning Component Both
4.	Tol	be cross-listed as:
		Prefix and Number Signature of chair of cross-listing department
5.	Req	quested effective date (term/year):/

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	rse to be offered (please check all that apply): Fall Spring Summer		
Will	the course be offered every year?	YES	□ N
If N	O, please explain:		
Why	y is this course needed?		
a.	By whom will the course be taught?	-	
b.	Are facilities for teaching the course now available?	☐ YES	□ N
	If NO, what plans have been made for providing them?		
Wha	at yearly enrollment may be reasonably anticipated?		
a.	Will this course serve students primarily within the department?	☐ Yes	1
b.	Will it be of interest to a significant number of students outside the department? If YES, please explain.	☐ YES	<u> </u>
Will	the course serve as a University Studies Program course [†] ?	☐ YES	
	the course serve as a University Studies Program course [†] ? ES, under what Area?	☐ YES	1
If Y		☐ YES	1
If Y	ES, under what Area?	☐ YES	
If Y	ES, under what Area? OF SPRING 2007, THERE IS A HIATUS ON APPROVAL OF NEW COURSES FOR USP.	☐ YES	1
If Y	ES, under what Area? OF SPRING 2007, THERE IS A HIATUS ON APPROVAL OF NEW COURSES FOR USP. ck the category most applicable to this course:	☐ YES	1
If Y	ES, under what Area? OF SPRING 2007, THERE IS A HIATUS ON APPROVAL OF NEW COURSES FOR USP. ck the category most applicable to this course: traditional – offered in corresponding departments at universities elsewhere	☐ YES	1
If Y. †AS	ES, under what Area? OF SPRING 2007, THERE IS A HIATUS ON APPROVAL OF NEW COURSES FOR USP. ck the category most applicable to this course: traditional – offered in corresponding departments at universities elsewhere relatively new – now being widely established	☐ YES	1
If Y. †AS Check	ES, under what Area? OF SPRING 2007, THERE IS A HIATUS ON APPROVAL OF NEW COURSES FOR USP. ck the category most applicable to this course: traditional – offered in corresponding departments at universities elsewhere relatively new – now being widely established not yet to be found in many (or any) other universities		
If Y $^{\dagger}AS$ Chee	ES, under what Area? OF SPRING 2007, THERE IS A HIATUS ON APPROVAL OF NEW COURSES FOR USP. ck the category most applicable to this course: traditional – offered in corresponding departments at universities elsewhere relatively new – now being widely established not yet to be found in many (or any) other universities sis course applicable to the requirements for at least one degree or certificate at UK?	☐ Yes	1

[‡]In order to change the program(s), a program change form(s) must also be submitted.

APPLICATION FOR NEW COURSE

17.	\checkmark	The major tead	thing objectives of the pr	roposed course, sylla	bus and/or referen	ce list to be used are attached.	
18.		Check box if course is 400G or 500.	and graduate students	by (i) requiring addit	ional assignments	us showing differentiation for us by the graduate students; and/or aduate students. (See SR 3.1.4)	
19.	With	nin the departme	nt, who should be conta	cted for further infor	mation about the p	proposed new course?	
Name	: Ca	arl G. Mattacol	a PhD, ATC	Phone: 323-1100	x80860 Email:	carlmat@uky.edu	1-171-1-1-1
20.	DA			Judith 1 printed name Shavon 3 printed name	Skwart	by Department Chair Ted by College Dean	signature Signature
;	*]		val by Undergraduate ouncil	printed name	Reported by U	Indergraduate Council Chair	signature
	* D	ATE of Approva	al by Graduate Council	printed name	Reported by	y Graduate Council Chair	signature
		3	14/08	Heidi An	Jerson	, Lite Mal	Louis
	*		oval by Health Care ouncil (HCCC)	printed name	Reported by Heal	th Care Colleges Council Chair	signature
	* I	DATE of Appro	val by Senate Council	-	Reported by (Office of the Senate Council	
	* D	ATE of Approva	al by University Senate		Reported by (Office of the Senate Council	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,

^{*}If applicable, as provided by the *University Senate Rules*

Muscle Mechanics **AT 700**

The University of Kentucky Division of Athletic Training

Instructor

Tim Butterfield PhD ATC 210B Wethington Building (office) (859) 323-1100 extension 80840 (office) 445 Wethington Building (laboratory) (859) 323-1100 extension 80887 (laboratory) tim.butterfield@uky.edu

Office hours: by appt.

Course Description

This is an elective, advanced athletic training course encompassing a wide range of topics related to all aspects of skeletal muscle form and function. The primary focus of this course will be on the mechanical properties of skeletal muscle, and translational aspects of basic science research and clinical care.

The course goal is to gain an advanced understanding of muscular contraction, muscle properties and experimental approaches to studying muscle. Secondary to this goal, is to translate the mechanical and physiological properties of skeletal muscle to athletic performance, and muscle injury and rehabilitation.

Instructional Strategies

The class will meet formally for 1.5 hours, two times per week. Instructional strategy will include lecture, discussion and formal student presentations.

Assigned Readings

See attached list

Required Texts

None

Optional References

- Theoretical Models of Skeletal Muscle, 1998, Walter Herzog and Marcelo Epstein
- Muscle Pain, 2001, Siegfreid Mense and David Simons
- Biomechanics of Musculoskeletal Injury, 1998, William Whiting and Ronald Zernicke
- Skeletal Muscle Form and Function, 2006, Brian Macintosh, Philip Gardiner and Alan McComas

Content

- 1. muscle morphology
- 2. the cross-bridge theory
- 3. mechanical properties of muscle
- 4. electromyography
- 5. muscle inhibition
- 6. in-vivo muscle function

University Policies:

Excused absences: The instructor expects everyone to attend every class and be on time. Attendance and punctuality will be tallied by the instructor and contributes to your class participation score. Each unexcused absence will account for 2% deduction from the class participation percentage. Therefore if you have 5 unexcused absences you will receive no credit for class participation which will account for 10% of your total grade. See Grading criteria below. Acceptable reasons for excused absences are listed in Student's rights and Responsibilities, Section 5.2.4.2. Briefly, these include serous illness, illness or death of someone in the student's immediate family, University sponsored trips, major religious holidays, and other circumstances the instructor finds reasonable. NOTE: If you intend to be absent to observe a major religious holiday, you must notify Dr. Butterfield in writing by Jan 29.

When there is an excused absence, you will be given the opportunity to make up missed work and/ or exams. It is the student's responsibility to inform the instructor of the absence, preferably in advance, but no later than one week after the absence.

Senate Rule 5.2.4.2 states that faculty have the right to request "appropriate verification" when students claim an excused absence because of illness or death in the immediate family. The University Health Services (UHS) will no longer give excuses for absences from class due to illness or injury. UHS forms can be date stamped to show that students went to the trouble of going to University Health Service, but it does not mean that students actually saw a physician or a nurse. If the faculty member wants further verification that a student kept an appointment with University Health Services (especially when there have been multiple or prolonged absences from class), the student will need to sign a release of information form (available from UHS) that will give permission for the staff to talk with the faculty member.

Withdrawal: Students should refer to the University Senate Rules, Section V,1.3.4 and 1.8-1.8.3 or Student Rights and Responsibilities.

Incompletes: Students should refer to the University Senate Rules Section V, 1.3.2 or Student Rights and Responsibilities.

Inclement weather: In case of inclement weather or emergencies, class will be held unless the University administration cancels classes. For University closing of classes and offices, call the UK Infoline at 257-5684 or check UKTV Cable Channel 16. Students should use their judgment about coming to class.

Cheating and Plagiarism: Revised Senate rules in regard to penalties for academic offenses are in effect. A summary of these changes may be found at http://www.uky.edu.Ombud. The consequences for offenses have become more flexible and should be reviewed carefully.

Cell Phone Policy: Cell phones, ipods, pagers, etc. should be turned off and out of sight during class time.

Classroom and Learning Accommodations: Instructors will make reasonable accommodations for physical and/or learning disabilities that could inhibit student academic success. The Disability Resource Center certifies the need for and specifies the particular type of such accommodations on a student-by-student basis. Students seeking accommodations must submit this certification to the faculty. Contact the Center staff at 257-2754.

Writing Skills: Helping promote scholarship is more than simply teaching the subject matter -- all students need to improve and refine their skills in verbal and written expression. Regardless of discipline, faculty have the right -and the obligation- to expect students to use English properly in all aspects of the course (S.R.5.2.4.3). Instructors may ask students to rewrite papers, make writing style one of the grading criteria, and report a seriously deficient student to his/her college for remedial work.

Topics:

Week 1 Introduction:

What is graduate school?

What is academic scientific research?

How does muscle contract?

Organization of Class and expectations

Weeks 2 &3 Structure:

Muscle

Neuromuscular junction

Motors units

Actin, myosin, cross-bridges, sarcomeres

Weeks 4&5 The cross-bridge theory:

Sliding filaments Huxley 1957 Huxley 1969

Huxley and Simmons 1971-Rayment et al. 1993

Week 5 Quality of the cross-bridge theory:

Gerry Pollack's scientific research Phase transition and muscle contraction

Weeks 6&7 Muscle properties:

The force-length relationship

Sarcomere Fiber Muscle

Importance in performance?

Importance in injury and rehabilitation

Weeks 8&9 Muscle properties:

The force/power-velocity relationship

Slow vs fast fibers Structural considerations

Weeks 10&11 Muscle properties:

So what? Connecting the dots

Performance, injury and rehabilitation considerations

Week 12 EMG

Surface, indwelling electrodes Measurement techniques

Analyses

Weeks 13&14 In-vivo muscle properties:

Isometric Concentric Eccentric

Muscle strain injury, adaptation and rehabilitation

Grading:

A = 90 - 100; B = 80-89; C = 70 - 79; E = 69 and below

Activity	weight
Article review / presentation	10%
Class Participation	10%
Exam 1	20%
Exam 2	20%
Exam 3	20%
Final Exam	20%

Class Participation:

- A Highly Prepared for AND actively engaged in class discussions
- B- Moderately prepared for OR moderately engaged in class discussions
- C- Questionable preparedness for OR little participation in class discussions
- E- No participation in class discussions