

1. General Information

1a. Submitted by the College of: MEDICINE

Date Submitted: 12/18/2012

1b. Department/Division: Molecular and Cellular Bi

1c. Contact Person

Name: Kevin Sarge

Email: kdsarge@uky.edu

Phone: 323-5777

Responsible Faculty ID (if different from Contact)

Name:

Email:

Phone:

1d. Requested Effective Date: Semester following approval

1e. Should this course be a UK Core Course? No

2. Designation and Description of Proposed Course

2a. Will this course also be offered through Distance Learning?: No

2b. Prefix and Number: BCH 419G

2c. Full Title: Molecular Basis of Human Disease

2d. Transcript Title:

2e. Cross-listing:

2f. Meeting Patterns

LECTURE: 3

2g. Grading System: Letter (A, B, C, etc.)

2h. Number of credit hours: 3

2i. Is this course repeatable for additional credit? No

If Yes: Maximum number of credit hours:

If Yes: Will this course allow multiple registrations during the same semester?

2j. Course Description for Bulletin: The goal of this course is to provide students with an understanding of the defining characteristics of the major human diseases, the molecular mechanisms responsible for causing these diseases, and some of the molecular technologies used to diagnose and treat them.

2k. Prerequisites, if any: BCH 401G

2l. Supplementary Teaching Component:

3. Will this course taught off campus? No

If YES, enter the off campus address:

4. Frequency of Course Offering: Spring,

Will the course be offered every year?: Yes

If No, explain:

5. Are facilities and personnel necessary for the proposed new course available?: Yes

If No, explain:

6. What enrollment (per section per semester) may reasonably be expected?: 70-100

7. Anticipated Student Demand

Will this course serve students primarily within the degree program?: No

Will it be of interest to a significant number of students outside the degree pgm?: Yes

If Yes, explain: [var7InterestExplain]

8. Check the category most applicable to this course: Relatively New – Now Being Widely Established,

If No, explain:

9. Course Relationship to Program(s).

a. Is this course part of a proposed new program?: No

If YES, name the proposed new program:

b. Will this course be a new requirement for ANY program?: No

If YES, list affected programs:

10. Information to be Placed on Syllabus.

a. Is the course 400G or 500?: Yes

b. The syllabus, including course description, student learning outcomes, and grading policies (and 400G-/500-level grading differentiation if applicable, from 10.a above) are attached: Yes

Distance Learning Form

Instructor Name:

Instructor Email:

Internet/Web-based: No

Interactive Video: No

Hybrid: No

1. How does this course provide for timely and appropriate interaction between students and faculty and among students? Does the course syllabus conform to University Senate Syllabus Guidelines, specifically the Distance Learning Considerations?

2. How do you ensure that the experience for a DL student is comparable to that of a classroom-based student's experience? Aspects to explore: textbooks, course goals, assessment of student learning outcomes, etc.

3. How is the integrity of student work ensured? Please speak to aspects such as password-protected course portals, proctors for exams at interactive video sites; academic offense policy; etc.

4. Will offering this course via DL result in at least 25% or at least 50% (based on total credit hours required for completion) of a degree program being offered via any form of DL, as defined above?

If yes, which percentage, and which program(s)?

5. How are students taking the course via DL assured of equivalent access to student services, similar to that of a student taking the class in a traditional classroom setting?

6. How do course requirements ensure that students make appropriate use of learning resources?

7. Please explain specifically how access is provided to laboratories, facilities, and equipment appropriate to the course or program.

8. How are students informed of procedures for resolving technical complaints? Does the syllabus list the entities available to offer technical help with the delivery and/or receipt of the course, such as the Information Technology Customer Service Center (<http://www.uky.edu/UKIT/>)?

9. Will the course be delivered via services available through the Distance Learning Program (DLP) and the Academic Technology Group (ATL)? NO

If no, explain how student enrolled in DL courses are able to use the technology employed, as well as how students will be provided with assistance in using said technology.

10. Does the syllabus contain all the required components? NO

11. I, the instructor of record, have read and understood all of the university-level statements regarding DL.

Instructor Name:

SIGNATURE|DANDRES|Douglas A Andres|Dept approval for ZCOURSE_NEW BCH 419G|20120928

SIGNATURE|BLTAUF2|Brandi L Stocker|College approval for ZCOURSE_NEW BCH 419G|20120928

SIGNATURE|JDLIND2|Jim D Lindsay|HCCC approval for ZCOURSE_NEW BCH 419G|20121001

SIGNATURE|ZNNIKO0|Roshan N Nikou|Graduate Council approval for ZCOURSE_NEW BCH 419G|20121001

SIGNATURE|JMETT2|Joanie Ett-Mims|Undergrad Council approval for ZCOURSE_NEW BCH 419G|20121029

SIGNATURE|WF-BATCH|Batch User|Reminder for minor course work item|20121217

Proposed new course BCH419G: “Molecular Basis of Human Disease”

Course Director: Dr. Kevin Sarge
Department of Molecular and Cellular Biochemistry
University of Kentucky College of Medicine
Office Phone: (859) 323-5777
E-mail: kdsarge@uky.edu

Office Hours: There will be scheduled office hours for the course, which will be listed in the syllabus on Blackboard, where you can meet with the instructors to address questions you have about lecture content.

How to communicate with the course director: You may contact me directly by e-mail; please include *BCH419G* in the subject line. I will respond within 24 hours (usually < 12 hours) on weekdays (M-F).

COURSE DESCRIPTION:

The objectives of the course are:

1. To provide students with an understanding of the defining characteristics of the major human diseases, including their symptoms, affected organs or cell types, and involvement of genetic mutations (where relevant).
2. To teach students the molecular mechanisms that are responsible for causing human diseases, focusing on examination of the dysregulation that occurs in normal cellular mechanisms and processes that impair cell and tissue functions, leading to disease symptoms.
3. To provide students with knowledge of molecular diagnostic techniques and of gene therapy and RNAi strategies and their uses in diagnosing and treating human diseases, respectively.

STUDENT LEARNING OUTCOMES:

After completing this course, the student will be able to:

1. Describe the major symptoms and affected organs/cell types of important human diseases.
2. Describe the molecular mechanisms involved in causing these diseases, and explain how the affected processes/pathways are different from that of the non-disease state.
3. Describe the basis of molecular diagnostic techniques and of gene therapy and RNAi-based treatment strategies.

Pre-requisite: BCH401G

Textbook: There is no required textbook but a good reference text for this course is Molecular Pathology (1st Edition): The Molecular Basis of Human Disease, Eds. W.B. Coleman and G. Tsongalis (Academic Press). ISBN: 9780123744197.

DESCRIPTION OF COURSE ACTIVITIES AND GRADING:

Summary Description of Course Assignments:

Examinations: There will be four examinations.

Short Papers (Graduate and Post-baccalaureate Students Only): Graduate and post-baccalaureate students enrolled in BCH419G will be required, in addition to taking the four exams, to complete a paper on an assigned disease topic, discussing what is known about the biochemical mechanism leading to that disease, its major symptoms and affected cell types/tissues, and any genetic mutations involved. Suggested resources include the OMIM (On-line Mendelian Inheritance in Man) database and research articles found in PubMed (no web site references). An abstract of no more than 200 words must be emailed to Dr. Sarge by _____ (date within 4 weeks of first class). **A printed copy of the paper must be given to Dr. Sarge by _____** (date at least 3 weeks before last exam). The papers are limited to four pages in length including text, figures, and tables (references list does not count in 4 page limit). The paper must be single-spaced, have font size 12 (Arial type preferred) and 1" margins all around. Papers will be given one of three grades: high pass, pass, or fail. Papers that are not submitted by the due date or are not compliant with format requirements will receive a failing grade.

Course Grading for Undergraduates: The final letter grades will be assigned based on total 100% (100 points) = 25% for each of the four exams (25 points per exam).

- A - 90.0-100.0% (90-100 points)
- B - 80.0-89.0% (80-89 points)
- C - 70.0-79.0% (70-79 points)
- D - 60.0-69.0% (60-69 points)
- E Less than 60.0% (up to 59 points)

Course Grading for Graduate and Post-baccalaureate Students: The final grades for graduate and post-baccalaureate students will be determined by the results of the four exams in conjunction with the performance on the short paper, as follows. For grades of high pass, pass, and fail for the short paper the percentages of +10%, +0%, and -10%, respectively, will be applied to their exam averages. For example, a graduate or post-baccalaureate student with a numerical average on the four examinations of 85% and a high pass on the paper would receive a final grade of 95%, which would be a final grade of "A" for the course. However, if that student received a mark of "fail" for the paper, they would have a 75% ("C") as their final grade for the course. **Final Course Grade Scale for Graduate Students and Post-baccalaureate Students:** A=90-100%; B=80-89%; C=70-79%; E= less than 70%.

Final Exam Information: The date, time, and location will be as listed in the UK Final Exam Schedule.

Mid Term Grade: Mid-term grades will be posted in myUK by the deadline established in the Academic Calendar (<http://www.uky.edu/Registrar/AcademicCalendar.htm>).

COURSE POLICIES:

Attendance Policy: Attendance is recommended, but not mandatory.

"Make up" Examinations: *Students are expected to take every examination, unless they have a qualified excused absence (see following section).* Students who miss an hour examination for an excused reason will not be given a make-up examination. Instead, the last examination will serve as the "make up" examination, and in this case count for 50% of the numerical grade instead of 25%.

Excused Exam Absences: Students need to notify the professor of absences prior to class when possible. S.R. 5.2.4.2 defines the following as acceptable reasons for excused absences: (a) serious illness, (b) illness or death of family member, (c) University-related trips, (d) major religious holidays, and (e) other

circumstances found to fit “reasonable cause for nonattendance” by the professor. *If you will be missing an examination for one of the above listed reasons, please contact Dr. Sarge as soon as you are aware of the conflict.*

Students anticipating an exam absence for a major religious holiday are responsible for notifying the Course Director in writing of anticipated absences due to their observance of such holidays no later than the last day in the semester to add a class. Information regarding dates of major religious holidays may be obtained through the religious liaison, Mr. Jake Karnes (859-257-2754).

Verification of Absences: Students may be asked to verify absences in order for them to be considered excused. 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 family. Appropriate notification of absences due to university-related trips is required prior to the absence.

Academic Integrity: Per university policy, students shall not plagiarize, cheat, or falsify or misuse academic records. Students are expected to adhere to University policy on cheating and plagiarism. The minimum penalty for a first offense is a zero on the assignment on which the offense occurred. If the offense is considered severe or the student has other academic offenses on their record, more serious penalties, up to suspension from the university may be imposed. Plagiarism and cheating are serious breaches of academic conduct. Each student is advised to become familiar with the various forms of academic dishonesty as explained in the Code of Student Rights and Responsibilities. Complete information can be found at the following website: <http://www.uky.edu/Ombud>. A plea of ignorance is not acceptable as a defense against the charge of academic dishonesty. It is important that you review this information as all ideas borrowed from others need to be properly credited.

Part II of *Student Rights and Responsibilities* (available online <http://www.uky.edu/StudentAffairs/Code/part2.html>) states that all academic work, written or otherwise, submitted by students to their instructors or other academic supervisors, is expected to be the result of their own thought, research, or self-expression. In cases where students feel unsure about the question of plagiarism involving their own work, they are obliged to consult their instructors on the matter before submission. When students submit work purporting to be their own, but which in any way borrows ideas, organization, wording or anything else from another source without appropriate acknowledgement of the fact, the students are guilty of plagiarism. Plagiarism includes reproducing someone else’s work, whether it is a published article, chapter of a book, a paper from a friend or some file, or something similar to this. Plagiarism also includes the practice of employing or allowing another person to alter or revise the work that a student submits as his/her own, whoever that other person may be. Students may discuss assignments among themselves or with an instructor or tutor, but when the actual work is done, the student, and the student alone must do it. The students must carefully acknowledge all sources of information. If the words of someone else are used, the student must put quotation marks around the passage and add an appropriate indication of its origin. Making simple changes while leaving the organization, content and phraseology intact is plagiaristic. However, nothing in these Rules shall apply to those ideas that are so generally and freely circulated as to be a part of the public domain (Section 6.3.1). Please note that any assignment you turn in may be submitted to an electronic database to check for plagiarism (<http://www.plagiarism.org/>). Failure to follow established university academic codes of conduct will result in a failing grade for the course and lead to steps toward academic dismissal.

Accommodations due to disability: If you have a documented disability that requires academic accommodations, please inform the instructor as soon as possible. In order to receive disability

accommodations in this course, you must provide a Letter of Accommodation from the Disability Resource Center (Room 2, Alumni Gym, 257-2754, email address: jkarnes@email.uky.edu).

Classroom Behavior Policies: Students are expected to maintain a proper learning environment in the classroom at all times, and to refrain from any activities or behaviors that negatively impacts the learning environment including but not limited to talking or making other sounds during the lecture at a level that distracts other students, and displaying inappropriate or distracting images on any electronic device that are visible to other people. When asking questions of the instructor or during class discussions, students are expected to maintain respectful dialogue at all times.

PARTICIPATING FACULTY:

Kevin Sarge, Ph.D., Biochemistry, kdsarge@uky.edu

Haining Zhu, Ph.D.

Primarily faculty in the Department of Biochemistry, but may include interested faculty from other units that have expertise in lecture topics.

Syllabus

<u>Meeting</u>	<u>Topic</u>
1.	Introduction and overview of Course.
2.	Molecular diagnostic techniques 1
3.	Molecular diagnostic techniques 2
4.	Overview of Neurodegenerative Diseases
5.	Alzheimer's Disease
6.	Huntington's Disease
7.	Parkinson's Disease
8.	Amyotrophic Lateral Sclerosis
9.	Prion diseases
10.	Muscular dystrophies
11.	Progeria and other premature aging diseases
12.	<u>Exam 1</u>
13.	Overview of Cancer
14.	Cell cycle and proliferation control
15.	Oncogenes and tumor suppressors
16.	Hematopoietic cancers
17.	Solid cancers
18.	Mechanisms of metastasis
19.	Cancer treatment strategies
20.	Epigenetics and human disease (cancer epigenetics, Angelman/Prader-Willi syndromes)
21.	Diseases of defective DNA repair (Xeroderma pigmentosum, Fanconi's anemia, Werner's syndrome)
22.	Chromosome number disorders (Down's, Trisomy 18, Klinefelter's and Turner's syndrome, etc.)
23.	<u>Exam 2</u>
24.	Diabetes 1
25.	Diabetes 2
26.	Overview of Metabolic Disorders
27.	Disorders of amino acid metabolism (phenylketonuria and maple syrup urine disease)
28.	Disorders of nucleotide metabolism (Lesch-Nyhan syndrome, gout)
29.	Disorders of carbohydrate metabolism (glycogen storage disease)
30.	Disorders of fatty acid oxidation (medium chain acyl coenzyme A dehydrogenase deficiency)
31.	Lysosomal storage diseases (Gaucher's and Niemann-Pick disease)
32.	Disorders of membrane metabolism (Tay-Sachs)
33.	<u>Exam 3</u>
34.	Cardiovascular Diseases 1: Atherosclerosis
35.	Cardiovascular Diseases 2: Clotting Disorders
36.	Sickle Cell Anemia
37.	Thalassemias and porphyrin metabolism disorders
38.	Autoimmune diseases
39.	Degenerative Eye Diseases (Macular Degeneration and Retinitis pigmentosa)
40.	Generation and use of animal models of human disease in research
41.	Gene therapy methods
42.	RNAi therapies
43.	Generation and medical applications of stem cells
44.	<u>Exam 4</u> Date, time, and location will be as listed in the UK Final Exam Schedule.