UNIVERSITY OF KENTUCKY

New Course Report

9/30/2014 9:47:26 AM

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1. General Information

1a. Submitted by the College of: PUBLIC HEALTH

Date Submitted: 8/11/2014

1b. Department/Division: Dept Of Biostatistics

1c. Contact Person

Name: Andrea Perkins

Email: andrea.perkins@uky.edu

Phone: 218-2021

Responsible Faculty ID (if different from Contact)

Name: Sujin Kim

Email: sujinkim@uky.edu

Phone: 218-0110

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?: Yes [4]

2b. Prefix and Number: BMI 730

2c. Full Title: Principles of Clinical Informatics

2d. Transcript Title:

2e. Cross-listing:

2f. Meeting Patterns

LECTURE: 45

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: This course offers an overview of Clinical informatics, which is the application of informatics principles, methods, and tools to support healthcare practice and research activities as well as business processes.

2k. Prerequisites, if any: None

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?: 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: A majority of students are expected from healthcare colleges such as medicine, dentistry, pharmacy, and nursing as well as public health. This course is dedicated to introduce principles of informatics in biomedical disciplines which have not been covered in any UK professional classes.

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?: No

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: Sujin Kim

Instructor Email: sujinkim@uky.edu

Internet/Web-based: Yes

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? This course provides timely interaction between students and faculty through blackboard emailing, UK emails, Blackboard announcements, and discussion boards. In addition, AdobeConnect will be used to communicate with students on a live mode. Yes, this course syllabus conforms to the UK guidelines specific to the distance learning consideration.

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. All aspects of the class materials and instruction including textbooks, course goals, assessment of student learning outcomes will be the same if the course is offered in the classroom based setting. So far, this class is planning to be purely online course and no further plan on in-class setting is expected at this moment.

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. Blackboard is password protected and the instructor will make sure to handle personal student matters as cautiously as possible. Time-stamped materials will be used to make sure the integrity of the students work.

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? No

If yes, which percentage, and which program(s)? N/A

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? Four instructors will maintain both off line and online office hours on a regular basis. Detailed office hours are highlighted in the course syllabus attached. Again, this class is not planned to be offered in a classroom setting.

6.How do course requirements ensure that students make appropriate use of learning resources? The students are instructed to read book chapters in line with the weekly lessons defined. The video clips and article readings that are carefully chosen to supplement course lecture slides will be provided for further discussions. Practical exercise driven assignments will be given to students to achieve learning goals to assess and review essential contents in biomedical informatics practice and research.

7.Please explain specifically how access is provided to laboratories, facilities, and equipment appropriate to the course or program. Besides textbook chapters, all other readings and videoclips assinged will be available based on free access, otherwise university licensed-articles. Learning tools and data assinged for practical exercises will be avaialble on a publicly accessible database, otherwise university licensed product through UK's library system.

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/)? Yes. Additional resources for resolving technical issues are stated on the syllabus, including instructions to notify the instructor immediately.

9.Will the course be delivered via services available through the Distance Learning Program (DLP) and the Academic Technology Group (ATL)? YES

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. N/A

10.Does the syllabus contain all the required components? YES

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

Instructor Name: Sujin Kim

SIGNATURE|ALHAYS0|Andrea L Perkins|BMI 730 NEW College Review|20140319

SIGNATURE|CHAPPELL|Joseph Chappell|BMI 730 ZCOURSE_NEW Approval Returned to Dept|20140425

SIGNATURE|ZNNIKO0|Roshan N Nikou|BMI 730 NEW Graduate Council Review|20140425

SIGNATURE|JTHU222|Jeffrey T Huber|BMI 730 ZCOURSE_NEW Approval Returned to Dept|20140428

SIGNATURE|ZNNIKO0|Roshan N Nikou|BMI 730 NEW Graduate Council Review|20140428

SIGNATURE|ZNNIKO0|Roshan N Nikou|BMI 730 NEW Graduate Council Review|20140428

SIGNATURE|ZNNIKO0|Roshan N Nikou|BMI 730 NEW Graduate Council Review|20140428

SIGNATURE|ALHAYS0|Andrea L Perkins|BMI 730 ZCOURSE_NEW Approval Returned to Dept|20140820

SIGNATURE|ALHAYS0|Andrea L Perkins|BMI 730 NEW College Review|20140811

SIGNATURE|ZNNIKO0|Roshan N Nikou|BMI 730 NEW Graduate Council Review|20140926

Courses	Request Tracking

New Course Form

https://myuk.uky.edu/sap/bc/soap/rfc?services=

Open in full window to print or save

[redacted]

Attachments:

Browse... No file selected. [redacted]

	ID	Attachment
Delete	3268	BMI 730 Syllabus 2-10-14 (All).pdf
Delete	3542	CCTS Letters of Support.pdf

First 1 Last

Select saved project to retrieve... [redacted]

(*denotes required fields)

1. General Information

a. * Submitted by the College of: PUBLIC HEALTH Submission Date: 8/11/2014

b. * Department/Division: Dept Of Biostatistics

c.

* Contact Person Name: Andrea Perkins Email: andrea.perkins@uky.edu Phone: 218-2021

* Responsible Faculty ID (if different from Contact) Sujin Kim Email: sujinkim@uky.edu Phone: 218-0110

d. * Requested Effective Date: ◉ Semester following approval OR ○ Specific Term/Year [1]

e.

Should this course be a UK Core Course? ○ Yes ◉ No

If YES, check the areas that apply:

☐ Inquiry - Arts & Creativity	☐ Composition & Communications - II
☐ Inquiry - Humanities	☐ Quantitative Foundations
☐ Inquiry - Nat/Math/Phys Sci	☐ Statistical Inferential Reasoning
☐ Inquiry - Social Sciences	☐ U.S. Citizenship, Community, Diversity
☐ Composition & Communications - I	☐ Global Dynamics

2. Designation and Description of Proposed Course.

a. * Will this course also be offered through Distance Learning? ◉ Yes [4] ○ No

b. * Prefix and Number: BMI 730

c. * Full Title: Principles of Clinical Informatics

d. Transcript Title (if full title is more than 40 characters):

e. To be Cross-Listed [2] with (Prefix and Number):

f. * Courses must be described by at least one of the meeting patterns below. Include number of actual contact hours[3] for each meeting pattern type.

45	Lecture	Laboratory[1]	Recitation	Discussion
	Indep. Study	Clinical	Colloquium	Practicum
	Research	Residency	Seminar	Studio
	Other	If Other, Please explain:		

g. * Identify a grading system:

◉ Letter (A, B, C, etc.)
○ Pass/Fail
○ Medicine Numeric Grade (Non-medical students will receive a letter grade)
○ Graduate School Grade Scale

h. * Number of credits: 3

i. * Is this course repeatable for additional credit? ○ Yes ◉ No

If YES: Maximum number of credit hours:

If YES: Will this course allow multiple registrations during the same semester? ○ Yes ○ No

j. * Course Description for Bulletin:

This course offers an overview of Clinical informatics, which is the application of informatics principles, methods, and tools to support healthcare practice and research activities as well as business processes.

k. Prerequisites, if any:

None

i. Supplementary teaching component, if any: ○ Community-Based Experience ○ Service Learning ○ Both

3. * Will this course be taught off campus? ○ Yes ● No

If YES, enter the off campus address:

4. Frequency of Course Offering.

a. * Course will be offered (check all that apply): ☑ Fall ☑ Spring ☐ Summer ☐ Winter

b. * Will the course be offered every year? ● Yes ○ No

If No, explain:

5. * Are facilities and personnel necessary for the proposed new course available? ● Yes ○ No

If No, explain:

6. * What enrollment (per section per semester) may reasonably be expected? 100

7. Anticipated Student Demand.

a. * Will this course serve students primarily within the degree program? ○ Yes ● No

b. * Will it be of interest to a significant number of students outside the degree pgm? ● Yes ○ No

If YES, explain:

A majority of students are expected from healthcare colleges such as medicine, dentistry, pharmacy, and nursing as well as public health. This course is dedicated to introduce principles of informatics in biomedical disciplines

8. * Check the category most applicable to this course:

☐ Traditional – Offered in Corresponding Departments at Universities Elsewhere
☑ Relatively New – Now Being Widely Established
☐ Not Yet Found in Many (or Any) Other Universities

9. Course Relationship to Program(s).

a. * Is this course part of a proposed new program? ○ Yes ● No

If YES, name the proposed new program:

b. * Will this course be a new requirement [5] for ANY program? ○ Yes ● No

If YES [5], list affected programs::

10. Information to be Placed on Syllabus.

a. * Is the course 400G or 500? ○ Yes ● No

If YES, the *differentiation for undergraduate and graduate students must be included* in the information required in **10.b**. You must include: (i) identification of additional assignments by the graduate students; and/or (ii) establishment of different grading criteria in the course for graduate students. (See SR 3.1.4.)

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.

Distance Learning Form

This form must accompany every submission of a new/change course form that requests distance learning delivery. This form may be required when changing a course already approved for DL delivery. **All fields are required!**

Introduction/Definition: For the purposes of the Commission on Colleges Southern Association of Colleges and Schools accreditation review, ***distance learning*** is defined as a formal educational process in which the majority of the instruction (interaction between students and instructors and among students) in a course occurs when students and instructors are not in the same place. Instruction may be synchronous or asynchronous. A distance learning (DL) course may employ correspondence study, or audio, video, or computer technologies.

A number of specific requirements are listed for DL courses. **The *department* proposing the change in delivery method is responsible for ensuring that the requirements below are satisfied at the individual course level.** It is the responsibility of the instructor to have read and understood the university-level assurances regarding an equivalent experience for students utilizing DL (available at http://www.uky.edu/USC/New/forms.htm).

Course Number and Prefix:	BMI 730	Date:	3/19/2014
Instructor Name:	Sujin Kim	Instructor Email:	sujinkim@uky.edu

Check the method below that best reflects how the majority of the course content will be delivered.

Internet/Web-based ☑ Interactive Video ☐ Hybrid ☐

Curriculum and Instruction

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?
   This course provides timely interaction between students and faculty through blackboard emailing, UK emails, Blackboard announcements, and discussion boards. In addition, AdobeConnect will be used to communicate with students

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.
   All aspects of the class materials and instruction including textbooks, course goals, assessment of student learning outcomes will be the same if the course is offered in the classroom based setting. So far, this class is planning to

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.
   Blackboard is password protected and the instructor will make sure to handle personal student matters as cautiously as possible. Time-stamped materials will be used to make sure the integrity of the students work.

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?
   No

   Which percentage, and which program(s)?
   N/A

   *As a general rule, if approval of a course for DL delivery results in 50% or more of a program being delivered through DL, the effective date of the course's DL delivery will be six months from the date of approval.

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?
   Four instructors will maintain both off line and online office hours on a regular basis. Detailed office hours are highlighted in the course syllabus attached. Again, this class is not planned to be offered in a classroom setting.

Library and Learning Resources

6. How do course requirements ensure that students make appropriate use of learning resources?
   The students are instructed to read book chapters in line with the weekly lessons defined. The video clips and article readings that are carefully chosen to supplement course lecture slides will be provided for further discussions.

7. Please explain specifically how access is provided to laboratories, facilities, and equipment appropriate to the course or program.
   Besides textbook chapters, all other readings and videoclips assinged will be available based on free access, otherwise university licensed-articles. Learning tools and data assinged for practical exercises will be avaialble on

Student Services

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/)?
   Yes.
   Additional resources for resolving technical issues are stated on the syllabus, including instructions to notify the

9. Will the course be delivered via services available through the Distance Learning Program (DLP) and the Academic Technology Group (ATL)?

   (•) Yes
   ( ) No

   If no, explain how students 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.
   N/A

10. Does the syllabus contain all the required components, below? ☑ Yes
    - Instructor's ***virtual*** office hours, if any.
    - The technological requirements for the course.
    - Contact information for Distance Learning programs (http://www.uky.edu/DistanceLearning) and Information Technology Customer Service Center (http://www.uky.edu/UKIT/Help/; 859-218-HELP).
    - Procedure for resolving technical complaints.
    - Preferred method for reaching instructor, e.g. email, phone, text message.
    - Maximum timeframe for responding to student communications.
    - Language pertaining academic accommodations:
      - "If you have a documented disability that requires academic accommodations in this course, please make your request to the University Disability Resource Center. The Center will require current disability documentation. When accommodations are approved, the Center will provide me with a Letter of Accommodation which details the recommended accommodations. Contact the Disability Resource Center, Jake Karnes, Director at 859-257-2754 or jkarnes@email.uky.edu."
    - Specific dates of face-to-face or synchronous class meetings, if any.
    - Information on Distance Learning Library Services (http://www.uky.edu/Libraries/DLLS)
      - Carla Cantagallo, DL Librarian
      - Local phone number: 859 257-0500, ext. 2171; long-distance phone number: (800) 828-0439 (option #6)
      - Email: dlservice@email.uky.edu
      - DL Interlibrary Loan Service: http://www.uky.edu/Libraries/libpage.php?lweb_id=253&llib_id=16

11. I, the instructor of record, have read and understood all of the university-level statements regarding DL.
    Instructor Name:
    Sujin Kim

Abbreviations: DLP = Distance Learning Programs ATG = Academic Technology Group Customer Service Center = 859-218-HELP (http://www.uky.edu/UKIT/Help)

~~Revised 8/09~~

[1] Courses are typically made effective for the semester following approval. No course will be made effective until all approvals are received.

[2] The chair of the cross-listing department must sign off on the Signature Routing Log.

[3] In general, undergraduate courses are developed on the principle that one semester hour of credit represents one hour of classroom meeting per week for a semester, exclusive of any laboratory meeting. Laboratory meeting, generally, represents at least two hours per week for a semester for one credit hour. (from SR 5.2.1)

[4] You must also submit the Distance Learning Form in order for the proposed course to be considered for DL delivery.

[5] In order to change a program, a program change form must also be submitted.

Rev 8/09

Submit as New Proposal | Save Current Changes

UNIVERSITY OF KENTUCKY
COLLEGE OF PUBLIC HEALTH

2/10/2014 (Last updated)

Course Syllabus
BMI 730: PRINCIPLES OF CLINICAL INFORMATICS
Fall 2014

BLACKBOARD ONLINE COURSE
NO INCLASS MEETINGS ARE REQUIRED
Virtual Office Hours: AdobeConnect link will be provided during instructors' office hours

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Contact information

Instructors and Contact Information:

Sujin Kim, Ph.D./Associate Professor of Biomedical Informatics
Multidisciplinary Science Building, 230G, 725 Rose Street, Lexington, KY 40536
859-218-0109 (Telephone) sujinkim@uky.edu (Email) – Preferred method of contact / 48 hour maximum response time
Office Hour: Tuesdays 3:30-5:30p or by Appointment

Radhakrishnan Nagarajan, Ph.D./Associate Professor of Biomedical Informatics
Multidisciplinary Science Building, 230F, 725 Rose Street, Lexington, KY 40536
859-218-0109 (Telephone) rnagarajan@uky.edu (Email) – Preferred method of contact / 48 hour maximum response time
Office Hour: Tuesdays: 11:00a to Noon or by Appointment

Lin Yang, Ph.D./Assistant Professor of Biomedical Informatics
Multidisciplinary Science Building 230D 725 Rose Street, Suite 230H Lexington, KY 40536
848 391-7869 (Telephone) lin.yang@uky.edu (Email) – Preferred method of contact / 48 hour maximum response time
Office Hour: Wednesdays between 1p-3p or by Appointment

Ramakanth Kavuluru, Ph.D./Assistant Professor of Biomedical Informatics
Multidisciplinary Science Building, 230E, 725 Rose Street, Lexington, KY 40536
859-218-0109 (Telephone) Ramakanth.Kavuluru@uky.edu (Email) – Preferred method of contact / 48 hour maximum response time
Office Hour: Tuesdays and Thursdays 11a to Noon or by Appointment

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Course description:

This course offers an overview of clinical informatics, which is the application of informatics principles, methods, and tools to support healthcare practice and research activities as well as business processes. The course is designed to appeal to clinical and biological researchers who want to learn more about informatics approaches, tools and methodologies for transforming, enhancing, and managing their practice and research. The course covers the context of biomedical informatics research, data management tools and methods, knowledge representation and discovery from pre-existing data sets and clinical care data, and emerging trends. Topics include healthcare information systems, assessing and improving data quality,

using IT to recruit patients, secondary use of clinical care data, patient registries, tools for automatically extracting structured data from clinical narratives, bioinformatics methodologies to understand sequence alignment, biological databases, knowledge discovery from high-throughput assays, systems biology and translational bioinformatics, and biomedical imaging informatics tools.

Course rationale:

With the increased application of computers to biomedicine, the clinical and research influence of biomedical computing systems is already remarkably broad. Clinical information systems are now installed in essentially all healthcare institutions. Physicians can search entire drug indexes in few seconds by using the large medical and medication data driven decision support systems to predict harmful side effects or drug interactions. Medical devices with embedded microprocessors and intelligent analytics routinely monitor patients and provide alerts or progress reports in critical care settings. Intelligent decision support tools that are equipped with advance imaging algorithms are now integrated with patient care systems which enhance optimal histologic grading.

Increasingly, healthcare practitioners and researchers are looking to information technology to help manage, enhance and transform their work. However, the traditional role of information technology in the field of healthcare has been limited to clerical and administrative tasks, with little or no consideration for clinical decision support or the delivery of care. Therefore, the current biomedical informatics courses have tended to reflect this limited perspective of clerical and administrative tasks by offering the core contents of health informatics concepts, theories, methods, tools and applications. Additionally, the advent of *Clinical Informatics* as a board-certified medical subspecialty is evidence of the expanding role of information and communication technology in the actual delivery of healthcare.

This course will provide a broad overview of these new application areas with a focus on informatics opportunities and challenges to clinical and biological research and/or population-based health research. That said, biomedical informatics approach will provide improved efficiency and new opportunities, such as increased efficiency of patient care, increased ease of recruiting patients, access to more data, ease of sharing data, and the ability to ask new kinds of questions. However, effectively using these methods and tools requires an understanding of the principles on which they are built. Improving these methods and tools also requires shared understanding and communication between IT and informatics workers and clinicians or biomedical researchers. This course will train students with backgrounds in either diverse clinical areas or translational research to use existing tools and contribute to the development of new tools for efficient patient care and research practice.

Course prerequisites:

None Required.

However, prior training or experience in clinical, biological or population-based health research OR a technical area, such as computer science, information science, and informatics is desirable.

Course objectives:

- Give health professionals the skills and knowledge to make effective use of healthcare informatics principles, methods, and tools in their research.
- Provide an overview of clinical research environments, the roles of researchers, providers and patients, basic clinical research methodologies and the different kinds of clinical research.

- Provide an overview of the different kinds of data management systems used in clinical research, including research information systems, research electronic data capture, bio-banking, and patient registries.
- Provide an overview of the informatics tools and methods for enhancing knowledge discovery from imaging informatics data, bioinformatics and clinical care data
- Provide hands-on experience with the state of the art tools and methods used in clinical informatics, such as research electronic data capture and cohort identification tools.

Competency for Biomedical Informatics
(Adopted from American Medical Informatics Association, 2013)

- Summarize and explain the history and values of the discipline and its relationship to related fields while demonstrating an ability to read, interpret, and critique the core literature
- Analyze, understand, abstract, and model a specific biomedical problem in terms of data, information and knowledge components
- Use the problem analysis to identify and understand the space of possible solutions and generate designs that capture essential aspects of solutions and their components
- Defend the specific solution and its advantage over competing options
- Demonstrate an ability to carry out the solution, to assess its validity, and iteratively improve its design
- Create new theories, typologies, frameworks, representations, methods, and processes to address biomedical and informatics problems
- Demonstrate the ability to team effectively with partners from diverse disciplines
- Communicate effectively to audiences in multiple disciplines in persuasive written and oral form

Core Competencies adopted from College of Medicine (UK):

- PATIENT CARE: Students will demonstrate the knowledge, skills and attitudes to effectively evaluate and treat common health problems and promote the health of patients.
- PC4: Formulate an appropriate evidence-based management strategy (both diagnostic and therapeutic) for patients with common acute and chronic conditions or problems

- MEDICAL KNOWLEDGE: Students will demonstrate the knowledge and skills to apply fundamental biomedical, clinical and social science to the care of patients.
- MK1: Demonstrate broad knowledge of fundamental biomedical and clinical principles underlying the mechanisms of disease and wellness
- MK3: Evaluate emerging basic science and clinical research with regard to its application to patient care

- PRACTICE-BASED LEARNING & IMPROVEMENT: Students will demonstrate the knowledge, skills and attitudes to critically evaluate performance and identify opportunities for improvement.
- PBLI4: Use information technology to access, appraise and assimilate high-quality scientific information and evidence to support clinical decision-making

- INTERPERSONAL & COMMUNICATION SKILLS: Students will demonstrate the skills and attitudes necessary to develop effective and appropriate relationships with patients, colleagues and other health professionals.
- ICS3: Produce and maintain clear, concise and timely documentation after clinical encounters to optimize medical care and minimize medical errors

- SYSTEMS-BASED PRACTICE: Students will demonstrate the knowledge, skills and attitudes to function effectively in teams and within health organizations.
- SBP2: Incorporate organizational, financial and health system factors into clinical decision-making to deliver effective, safe, timely, patient-centered, cost-sensitive and efficient medical care
- SBP3: Identify barriers to safe and appropriate care, analyze for potential health system limitations, and propose solutions

Professional Competencies and Outcome Expectations for professional pharmacist competencies, 2011:

- Provide patient care in cooperation with patients, prescribers, and other members of an interprofessional health care team based upon sound therapeutic principles and evidence based data, taking into account relevant legal, ethical, social, cultural, economic, and professional issues, emerging technologies, and evolving biomedical, pharmaceutical, social/behavioral/administrative, and clinical sciences that may impact therapeutic outcomes.

- Manage and use resources of the health care system, in cooperation with patients, prescribers, other health care providers, and administrative and supportive personnel, to promote health; to provide, assess, and coordinate safe, accurate, and time-sensitive medication distribution; and to improve therapeutic outcomes of medication use.
- Promote health improvement, wellness, and disease prevention in cooperation with patients, communities, at-risk populations, and other embers of an interprofessional team of health care providers.

College of Public Health Competencies- adopted from MPH Cross-cutting competencies, 2013

- Organize and deliver effective written and verbal communications about public health activities using appropriate communication strategies to professionals, labor, industry, the general public and the media.
- Use evidence based principles and scientific knowledge effectively when involved in evaluation and decision-making in public health.
- Manage potential conflicts of interest encountered by practitioners, researchers, and organizations.
- Collaborate in interprofessional partnerships to implement organizational initiatives at the individual, organizational, and community level.
- Apply ethical principles to public health program planning, implementation and evaluation.

Student learning outcomes:

Upon completion of this course, the learner will:

- Be able to use, select or recommend appropriate informatics principles, methods and tools for conducting, managing, and enhancing clinical service and research.
- Describe the healthcare research and practice environment, including the main kinds of environments, the roles of researchers, providers and patients, basic clinical research methodologies and the different kinds of clinical and population-based research.
- Participate in the development of new informatics solutions to support clinical or population-based research

- Describe the different kinds of data management systems used in clinical research and population-based research including research information systems, research electronic data capture, bio-banking, patient registries, biomarkers, imaging data, and narrative clinical documentation.
- Describe the informatics tools and methods for enhancing knowledge discovery from healthcare practice and informatics research data.
- Describe healthcare research informatics challenges and future directions.

Textbooks (Required)

- Nelson, Ramona & Staggers, Nancy. Health Informatics: An Interprofessional Approach, Mosby, 2013.
- Richesson, Rachel L & Andrews, James. Clinical Research Informatics, Springer-Verlag London Limited, 2012.
- Selected readings will be posted via Blackboard on a weekly basis.

Technology Requirements

Since this is a distance-learning course, students are required to have stable access to a computer and hence encourage students to own a personal computer (laptop/desktop is okay but tablets are not sufficient) according to these requirements:
http://www.uky.edu/ukit/hardwareguide
Furthermore, to fully participate in the distance learning experience students are also required to install the following software and acquire useful hardware:

http://www.uky.edu/DistanceLearning/current/technology/techReqs.html

Course requirements and learner evaluation

Course grades will be based upon evaluation of the following activities:
[Note the portion of the final grade represented by each component]

Midterm: 25%	(250 points)
Final: 25%	(250 points)
Assignments: 50%	(500 points)

Points	Letter Grade
1000-900	A
899-800	B
799-700	C
0-699	E

Midterm (25%) and Final Exams (25%) – (2 exams, 250 points each, 500 points total)

- Date/Time: Two exams including mid-term and final exams will be conducted through Blackboard courseware on the designated dates (see course calendar for the dates and time). *The Blackboard online exam links will be provided between 6a-11:59p on the designated exam dates. Be sure to make yourself available to take the exams. Each exam will be limited to take for an hour and a half, once you launch to take it.*
- Rules: No books, notes, external references are allowed. No cheating! For proofs you should only use the tools and techniques covered in class.

- Grading: Two exams will be worth of 250 points each and accounts for 50 percent of the points total for this course. Grading will be posted within a couple of weeks after the exams. (Note: Manual reading is required to finalize grading.)
- Exam content: The exams will be on the course materials covered. For the midterm exam, the contents will cover topics 1 through 6. For the final exam, the contents will cover the topics 7-12. The questions will be a mix of multiple choices, multiple answers, true/false, and short essay questions.
- Study guide: Further study guide materials will be distributed at least one week prior to each exam.

Assignments (50%) – (5 assignments, 100 points each, 500 points total)

- **Assignment 1:** *Analysis of an informatics organization and job postings* (10%) *100 points*
  This assignment is to give you an opportunity to review an informatics organization to determine which organization fits best with your interest. You can select one organization such as AMIA, HIMSS, ATA, AHIMA, ANI, or ANIA, etc. or identify your own choice of organization within health informatics groups. Explain how you matched your areas of interest to the information on the Website of your chosen organization. Answer the five discussion questions given. Your answers should be based on class readings and lecture notes. Your report is limited to a 2,000 word count.

- **Assignment 2:** *Analysis of healthcare information* (10%) *100 points*
  This assignment is to give you an opportunity to understand different types of healthcare information. Contact a healthcare facility (hospital, nursing home, physician's office, or other organization) to ask permission to view a sample of your health records they maintain. If you do not have any healthcare contact for your own records, you can use a sample of record provided for this assignment. To get full credit, please answer the following seven questions: 1) what is the primary reason (or condition) for which the patient was admitted to the hospital?; 2) how long has the patient had this condition?; 3) did the patient have surgery during this admission? If so, what procedure(s) was (were) done?; 4) Did the patient experience any complications during this admission? If so, what were they? 5) How does the physician's initial assessment of the patient compare with the nurse's initial assessment? Where in the record would you find this information?; 6) Where was the patient discharged to and in what condition?; and 7) What were the patient's discharge orders or instructions? Where in the records should you find this information?

- **Assignment 3**: *Evidence based medicine (EBM)* case study (10%) *100 points*
  This assignment is to provide you competent understanding of core steps of EBM. Students are asked to identify five basic components of EBM from five given clinical cases. Five components included are: 1) to formulate answerable EBM questions, 2) to identify a patient in question, 3) to identify intervention or control in the EBM questions, 4) to decide relevant set of evidences (medical references), and 5) to plan an EBM application plan to treat a patient in question. Your report should include your learning feedback on this assignment which should be no more than 1,000 words, maximum.

- **Assignment 4**: Clinical natural language processing analysis (10%) *100 points*
  This assignment deals with automatic extraction and analysis of clinical narratives such as discharge summaries for better use in clinical decision-making and clinical trial recruitment. Students will be asked to use open source tools to extract biomedical and clinical concepts such as diseases, procedures, and medications and also inter-concept relationships. A collection of discharge summaries along with a set of questions pertaining to the information extracted from them will be given to students at least two weeks prior to assignment due. The learning evaluation on this task needs to be reported within 1,000 words limit.

- **Assignment 5**: Biomedical image retrieval using relevance feedback analysis (10%) *100 points*
  In this assignment, you will need to answer a set of questions with respect to basic biomedical image retrieval using relevance feedback. Relevance feedback is an interactive procedure that works to re-rank the Content Based image Retrieval (CBIR) results. Given the doctor's relevant or non-relevant labels (only part of the retrieved results are needed to be labeled), an ensemble classifier will be trained and the final CBIR results will be re-ranked. The student will need to answer questions related to the principles of relevance feedback algorithm given. Digitized images and a decision guide will be provided at least two weeks prior to assignment due. Your learning evaluation on this assignment is required to be reported within 1,000 words, maximum.

Assignment Submission:

All assignments are to be submitted via Blackboard Assignment folder. The submission drop-link along with the detailed assignment instruction will be posted at least two weeks prior to each due. If any technical error occurs, make sure to submit a copy of your assignment via email at sujinkim@uky.edu

Instructor expectations

1. I expect you to attend or watch online every class session. This is primarily a class for us to learn through reading, presentations, hands-on demonstrations and classroom/chat room discussion.
2. I expect you to read and critically evaluate all assigned material prior to attending or viewing the lectures.
3. I expect (and encourage) you to provide honest and timely feedback regarding the content and process of this course throughout the semester.
4. I expect you during the semester to interactively engage via the online discussion board with the other students and the instructor.
5. I expect you to share in the responsibility for making this course an enjoyable and beneficial learning experience.

Special Notes:

The challenge related to teaching and taking a course on-line is not trivial. In particular, it requires that you make serious effort to keep up with readings and work, take advantage of the communication mechanisms and other tools built into the Blackboard courseware, and continually assess yourself to ensure that you have a grasp of the subject matter. It is particularly important to log onto the course often in order to keep up with the topics being discussed.

Academic honesty

Academic honesty is highly valued at the University. You must always submit work that represents your original words or ideas. If any words or ideas used in a class assignment submission do not represent your original words or ideas, you must cite all relevant sources and make clear the extent to which such sources were used. Words or ideas that require citation include, but are not limited to, all hard copy or electronic publications, whether copyrighted or not, and all verbal or visual communication when the content of such communication clearly originates from an identifiable sources. 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 in all courses. 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. All incidents of cheating and plagiarism are taken very seriously at the University of Kentucky, and there are specific policies and

procedures in place to prosecute them. See S.R. 6.3.0 (PDF) for the exact Senate Rules regarding academic offenses.

Statement on Plagiarism

The faculty of the Division of Biomedical Informatics and the College of Public Health will enforce and administer rules concerning plagiarism as set forth in *Student's Rights and Responsibilities.*

"*Plagiarism means taking the words and thoughts of others (their ideas, concepts, images, sentences, and so forth) and using them as if they were your own, without crediting the author or citing the source. Most plagiarism is willful, a sort of theft. It is possible to plagiarize unintentionally, though, by being careless or hurried, omitting quotation marks or slipping into the words or ideas of others through inattention or simply for convenience. Whether you meant it or not, you can be found guilty of plagiarism whenever other people's language gets used without proper citation in your text. At this and most other universities, plagiarism is regarded as intellectual theft; faculty will rarely bother to determine whether you stole words on purpose or walked out of the shop having forgotten to pay.*" http://www.uky.edu/Ombud/Plagiarism.pdf

"This is how the faculty and students at UK have defined plagiarism (from Senate Rule 6.3.1):

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...

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 acknowledgment of the fact, the students are guilty of plagiarism.

Plagiarism includes reproducing someone else's work, whether it be published article, chapter of a book, a paper from a friend or some file, or whatever. Plagiarism also includes the practice of employing another person to alter or revise the work which 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, it must be done by the student, and the student alone.

When a student's assignment involves research in outside sources or information, the student must carefully acknowledge exactly what, where and how he/she has employed them. If the words of someone else are used, the student must put quotation marks around the passage in question 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 which are so generally and freely circulated as to be a part of the public domain."

Accommodations

If you have a documented disability that requires academic accommodations, please see me as soon as possible during scheduled office hours. In order to receive accommodations in this course, submit to me a Letter of Accommodation from the Disability Resource Center. If you have not already done so, please register with the Disability Resource Center for coordination of campus disability services available to students with disabilities. Contact Jake Karnes via email at jkarnes@email.uky.edu or by telephone 859-257-2754. You may also visit the DRC website for information on how to register for services as a student with a disability: http://www.uky.edu/StudentAffairs/DisabilityResourceCenter/

Religious Observances
Students will be given the opportunity to make up work (typically, exams or assignments) when students notify their instructor that religious observances prevent the student from completing assignments according to deadlines stated in this syllabus. Students must notify the course instructor at least two weeks prior to such an absence and propose how to make up the missed academic work.

Inclement weather
The University of Kentucky has a detailed policy for decisions to close in inclement weather. This policy is described in detail at http://www.uky.edu/PR/News/severe_weather.htm or you can call (859) 257-1754.

Late work policy:
Assignments that are turned in late will be marked one letter grade lower unless prior approval from the instructor has been obtained. It will be based on the time stamp provided by Blackboard. (NOTE: Assignments more than one week past the original due date will not be graded.)

Excused absences policy
Attendance, excused absences and make-up opportunities for this course will conform to the course policies established by the Office of Academic Ombud Services as found at www.uky.edu/Ombud/policies.php

Other University Resources
The UK Violence Intervention and Prevention (VIP) Center provides advocacy services to women survivors of violence in the UK community. The VIP Center can provide assistance in accessing and navigating services, resources and referrals both on and off campus. Services include: academic advocacy, medical advocacy, counseling, financial advocacy, referral advocacy, and other practical needs that a student may request. 106 Frazee Hall, 257-3574 or 257-3564. http://www.uky.edu/StudentAffairs/VIPCenter/index.html#

Technical Requirements (Adopted from Distance Learning Recommendation):
"In order to have a successful educational experience in distance learning courses, there are minimum technology requirements that should be met. The University of Kentucky strongly recommends that each student purchase a personal computer. To review minimum recommendations and guidelines for your computer click here.
University of Kentucky distance learning students are also encouraged to acquire the following hardware, software, and Internet connection to ensure that all systems used by distance learning courses will function properly."
Go to the link at: http://www.uky.edu/DistanceLearning/current/technology/techReqs.html to test your network speed and other necessarily technology requirements for this class.

Information on Distance Learning Library Services
- Available at: http://libraries.uky.edu/dlls
- Carla Cantagallo, DL Librarian, (859) 218-1240
- Email: dllservice@email.uky.edu
- DL Interlibrary Loan Service: http://libraries.uky.edu/page.php?lweb_id=253

Information on UK Medical Center Libraries-(MCL) and Blackboard
- MCL Homepage: http://libraries.uky.edu/MCL
- MCL Classes: http://libraries.uky.edu/libpage.php?lweb_id=33&llib_id=12
- Off-Campus Access Instructions (Proxy Help): http://libraries.uky.edu/page.php?lweb_id=16
- Blackboard Wiki: http://wiki.uky.edu/blackboard/Wiki%20Pages/Home.aspx

- Blackboard Blog: http://blog.uky.edu/Blackboard/default.aspx

Contact information for:

- TASC http://www.uky.edu/ukit/atg/tasc
- Information Technology Customer Service Center http://www.uky.edu/ukit/

Technical Issues

- Students should contact the instructor (via email) and the UKIT help desk in case they are unable to access the materials (http://www.uky.edu/UKIT, 859-218-HELP) so that issues can be resolved in a timely fashion and homework can be submitted on time.

- **Course schedule and topics**

The following course topics are based on three informatics learning blocks including (1) Backgrounds of Healthcare Informatics (*Block I*), (2) Healthcare Information Systems, Users, and Governance (*Block II*), and (3) Major Informatics Methodologies and Applications (*Block III*).

Table 1: Course Topics by 3 thematic blocks

BLOCK 1:	**BLOCK II:**	**BLOCK III:**
Backgrounds of Healthcare Informatics	Healthcare Information Systems, Users, and Governance	Major Informatics Methodologies and Applications
• Evolution of Health Informatics • Theoretical Foundation of Health Informatics	• Electronic Health Records and Applications for Managing Patient Care • Clinical Decision Support Systems in Healthcare	• Knowledge Representation and Ontologies • Clinical Natural Language Processing
• Evidence Based Practice and Informatics	• Telehealth and applications for Delivering Care at a distance • Home Health and Related Community-based System	• Multimedia Electronic Health Records • Imaging Informatics
• Knowledge Discovery, Data Mining, and Practice-Based Evidence	• Personal Health Records • E-Patients and Social Networking and web-based applications	• Personalized Medicine • Clinical Research in the Postgenomic Era • Bioinformatics
	• Identifying and Selecting an Information System Solution • Implementation and Upgrading and Information System • Downtime and Disaster Recovery of Health Information Systems	• Clinical Research Informatics • Biobanking Challenges and Informatics Opportunities
	• Privacy, Confidentiality, Security, and Data Integrity • Patient Safety and Quality Initiatives in Informatics	

Table 2: Course Calendar by Weeks, Topics, Readings, and Assignments

- *Supplementary article readings and video clips will be posted in Blackboard course folder on a weekly basis.*
- *Two online exams will be conducted via Blackboard exam and the links will be available between 6a-11:59p on the designated exam dates.*
- *Assignments should be dropped in Blackboard Assignments folder by 6pm, EST of each due date*

Week / block / (Instructor)	Topics	Textbook/ Readings	Assignments and Due Dates
Week 1 / BLOCK I (Sujin 1)	• Evolution of Health Informatics • Theoretical Foundation of Health Informatics	R. Nelson Ch.1 Ch. 2	
Week 2 / BLOCK I (Radha 1)	• Evidence Based Practice and Informatics	R. Nelson Ch.3	
Week 3 / BLOCK I (Radha 2)	• Knowledge Discovery, Data Mining, and Practice-Based Evidence	R. Nelson Ch. 4	Assignment 1: *Analysis of Organizations and job postings*
Week 4 BLOCK II (Rama 1)	• Electronic Health Records and Applications for Managing Patient Care • Clinical Decision Support Systems in Healthcare	R. Nelson Ch. 6 Ch. 10	
Week 5 BLOCK II (Lin 1)	• Telehealth and applications for Delivering Care at a distance • Home Health and Related Community-based System	R. Nelson Ch. 8 Ch. 9	Assignment 2: *Analysis of healthcare information*
Week 6 BLOCK II (Sujin 2)	• Personal Health Records • E-Patients and Social Networking and web-based applications	R. Nelson Ch. 13 Ch. 14 Ch. 15	
Week 7	**REVIEW WEEK**		
Week 8	**MIDTERM EXAM (6A-11:59P)**		
Week 9 BLOCK II (Lin 2)	• Identifying and Selecting an Information System Solution • Implementation and Upgrading and Information System • Downtime and Disaster Recovery of Health Information Systems	R. Nelson Ch. 16 Ch. 17 Ch. 18	Assignment 3: *Evidence based medicine case study*
Week 10 BLOCK II (Rama 2)	• Privacy, Confidentiality, Security, and Data Integrity • Patient Safety and Quality Initiatives in Informatics	R. Nelson Ch. 19 Ch. 20	
Week 11 BLOCK III (Rama 3)	• Knowledge Representation and Ontologies • Clinical Natural Language Processing	R. Richesson Ch. 14 Ch. 16	
Week 12 BLOCK III (Lin 3)	• Multimedia Electronic Health Records • Imaging Informatics		Assignment 4: *Clinical natural language processing project*

Week 13 BLOCK III (Radha 3)	• Personalized Medicine • Clinical Research in the Postgenomic Era • Bioinformatics	R. Richesson Ch. 7	
Week 14 BLOCK III (Sujin 3)	• Clinical Research Informatics • Biobanking Challenges and Informatics Opportunities	R. Richesson Ch. 1 Ch. 12	Assignment 5: *Image process and analysis project*
Week 15	**REVIEW WEEK**		
Week 16	**FINAL EXAM (6A-11:59P)**		

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UNIVERSITY OF KENTUCKY
Center for Clinical and Translational Science (CCTS)

Center for Clinical and
Translational Science
UK Chandler Medical Center
Pavilion H
800 Rose Street, Room C300
Lexington, KY 40536-0293
www.ccts.uky.edu

May 29, 2014

Stephen W. Wyatt, DMD, MPH
Dean
College of Public Health
111 Washington Avenue, Room 112
CAMPUS 0003

Dear Dean Wyatt:

The NIH CTSA program places great value on biomedical informatics research and training programs. For CTSAs, from a training perspective, informatics, bioinformatics and clinical/informatics content and courses for professional and academic doctoral, as well as professional and academic masters students are major priorities. Every aspect of the health sciences, from basic research, to clinical care to community based outcomes studies, will continue to be dependent on the analysis of data and the translation of data into information, and thus it is critically important that we train the next generation of clinicians and researchers in informatics. The UK Center for Clinical and Translational Science (CCTS), as part of the NIH CTSA network, has been building courses for students on our campus. The proposed courses are part of the CCTS plan to build toward an academic degree offering in biomedical informatics. In addition, the courses will also be available to professional doctoral students in Medicine and Pharmacy, and will be available for inclusion in certificate programs on our campus. These courses have potential beyond our campus; Medical schools at Marshall University, East Tennessee State University and the University of Pikeville are exploring arrangements to access these courses for their students.

As the CCTS prepares for its next grant submission in 2015-2016, these courses are an important and strategic priority.

Sincerely,

Phillip A. Kern, M.D.
Professor of Medicine, Division of Endocrinology
Director, Center for Clinical and Translational Sciences
Associate Provost for Clinical and Translational Science
Director, Barnstable Brown Diabetes and Obesity Center

UNIVERSITY OF KENTUCKY

June 6, 2014

Stephen W. Wyatt, DMD, MPH
Dean
College of Public Health
111 Washington Avenue, Room 112
CAMPUS 0003

Dear Dean Wyatt:

As you know, the PhD program in Epidemiology and Biostatistics is intended to be an integrative doctoral program which prepares future researchers who will have substantial quantitative preparation in the unique domains of these two disciplines. The essentially strong cross-training and mentoring nature of the program is intended to develop independent researchers skilled in designing and conducting studies, as well as analyzing and interpreting the results from an increasing variety of study designs.

As the current Chair of Academic Affairs, I recently reviewed the large complement of courses in bioinformatics, clinical informatics, information retrieval, and natural language processes that have been developed by our faculty in the Division of Bioinformatics. Many of these courses may be suitable electives for our doctoral students. As you are aware, there has been an intense demand for scientifically trained (subject matter) data analysts who can address the issues in conducting studies which include large amounts of complex data.

For epidemiologists and biostatisticians working in human genome epidemiology, statistical genetics, and related disciplines, the field will require a better understanding of the management and retrieval of information from these large datasets. Training in biomedical informatics will be appealing to some of our PhD students in Epidemiology and Biostatistics and will be encouraged by many of our program faculty.

Sincerely,

Steve Browning

Steven R. Browning, PhD
Associate Professor, Director of Graduate Studies for the PhD
Department of Epidemiology
111 Washington Ave, Suite 209B
Lexington, Kentucky 40536-0003
(859) 218-2235
Phone: (859) 218-2235
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UNIVERSITY
OF KENTUCKY

College of Public Health

Department of Preventive Medicine and Environmental Health
111 Washington Avenue, Suite 220
Lexington KY 40536-0003
(859) 257-5678 Ext. 82100
Fax (859) 257-9862
www.mc.uky.edu/PublicHealth

June 6, 2014

Stephen W. Wyatt, DMD, MPH
Dean
College of Public Health
111 Washington Avenue, Room 112
CAMPUS 0003

Dear Dean Wyatt:

I am writing to offer my enthusiastic support for the new biomedical informatics courses that are being proposed to the Graduate Council. As you know, the Master of Science program in Clinical Research Design is intended to prepare practicing health care professionals and students pursuing a terminal degree (MD, PharmD, etc.) to conduct population based research. The program is targeted to students who wish to enhance their translational research skills and increase their knowledge of population-based health and clinical trials. MDs interested in an academic appointment will find that this degree program will make them competitive for the best positions, where research skills are becoming the norm. Of particular demand for medical researchers are effective uses of biomedical data, information, and knowledge for scientific inquiry, problem solving and decision-making motivated by efforts to improve human health.

Our MS program is designed to accommodate graduates of the Certificate in Clinical Research Skills offered in conjunction with the Center for Clinical and Translational Sciences, which strongly emphasizes and relies on biomedical informatics. The addition of these courses to the list of electives that Clinical Research Design students can choose will be extremely attractive to current students, and may perhaps entice prospective students to pursue the Graduate Certificate or degree program. The faculty proposing and teaching these courses are great partners in education and research and I look forward to strengthening existing ties through implementation of these courses. For these reasons, as Director of Graduate Studies for the MS program in Clinical Research Design, I fully support these new course proposals.

Sincerely,

David M. Mannino, M.D.
Professor and Chair
Department of Preventive Medicine and Environmental Health
Director of Graduate Studies, Masters of Science in Clinical Research Design
University of Kentucky College of Public Health

Department of Pulmonary, Critical Care, and Sleep Medicine
University of Kentucky College of Medicine

Perkins, Andrea L

To: Miroslaw Truszczynski
Subject: RE: Support for BMI courses

From: mirektruszczynski@gmail.com [mailto:mirektruszczynski@gmail.com] **On Behalf Of** Miroslaw Truszczynski
Sent: Wednesday, July 16, 2014 9:46 AM
To: Perkins, Andrea L
Cc: Nagarajan, Radha; KIM, SUJIN; Wray, Johanna (JoJo)
Subject: Re: Support for BMI courses

I reviewed the proposals for the new biomedical courses BMI 633, 730-735. I find them useful to candidates for the Informatics Certificate, pursued typically by 2-4 students per year.

I support their approval.

Mirek Truszczynski
Director, Informatics Certificate