General reason for this request:
This course is a required course in the proposed PhD in Biomedical and Health Informatics curriculum.

This request should be processed at the same time as the following related academic program request(s): New program application for PhD in Biomedical and Health Informatics

Requested type of approval and effective date:
Permanent approval effective Fall semester, 2016

Course Subject (Rubric): BHIS / Biomedical and Health Information Sciences
Primary Unit: Biomedical and Health Information Sciences
Course Number: 502
Course Version: 1

Course Title: Methods in Biomedical and Health Informatics II
Transcript Title: Methods in BHI II

Course Description:
Continues BHIS 501. Second in a two course series providing foundational knowledge of the methods, language, and technology in biomedical and health informatics research, including an exploration of their benefits and challenges in use.

Notes to Students:
Taught in English. Extensive computer use required.

Cross Listings:
None

Previous Course Number and/or Subject:
None

Expected Registration:
Graduate College

Type of Course:
Requirement for the following programs: PhD in Biomedical and Health Informatics

Course Learning Outcomes:
Students will be able to

1. Outline the major classes of methods used in BHI research.
2. Select the appropriate method when presented with a variety of BHI research problems.
3. Apply the appropriate method from each of the major topics to solve practical research problems.

Course Learning Outcome Assessment Methods:
1. Through readings, small group seminar, individual and group assignments, students will build their repertoire of understanding the major classes of methods used in BHI research.

2. Through individual and group assignments, students will learn to apply the methods associated with each of the major domains of biomedical and health informatics research.

3. Through examination, students will demonstrate their ability to choose the appropriate method when presented with a BHI research problem.

Purpose of this course in relation to overall curriculum and relationship to other courses offered by primary unit:

The core competencies for the methods of collection, analysis, and presentation of health care data are offered in a series of two courses. The two course sequence is the result of collaboration among Health and Biomedical Informatics researchers and educators at UIC, Northwestern University, and University of Chicago and brings to the students at these three institutions the power of the faculty across three major institutions—all supporting clinical and translational sciences across the spectrum. UIC faculty have taught in the course as offered at Northwestern University’s Health Sciences Integrated PhD program since fall 2013, which was the first term this curriculum was ever offered.

Relationship of this course to similar courses offered by other academic units:

This course, a continuation of BHIS 501, represents the specialized level of knowledge, skills, and attitudes (KSA) specific to the collection, analysis, and presentation of health care data that is expected of doctoral students in BHI. These KSAs are fundamentally different from the basic principles in traditional quantitative and qualitative research methods introduced in BHIS 500 Strategic Inquiry in BHI.

Major Topics:

1. Machine Learning: Graph Theory and Graphical Methods (4)
2. Natural Language Processing: Information Retrieval & Information Seeking (4)
3. Natural Language Processing: Parsing & Deterministic Methods (4)
4. Natural Language Processing: Probabilistic Methods (4)
5. Project Presentations (4)
6. Understanding Individuals: Comprehension, Reasoning & Naturalistic Decision Making (4)
8. Human Computer Interaction: Prototyping and participatory design (4)
9. Human Computer Interaction: Data presentation and visualization (4)
10. Understanding Groups 1: Social Network Analysis (4)
11. Understanding Groups 2: Technology Adoption (4)
12. Evaluation 1: Theory: Reliability and Validity (4)
15. Student Presentations, Discussions (4)

Total 60 contact hours

Sample Sources and Resource Materials:

Seminal Articles


Books

James, G., Witten, D., Hastie, T., & Tibshirani, R. (2013). An introduction to statistical learning (pp. 303-320). New York: Springer.


Other Readings


**Prerequisite(s):**
Grade B or better in BHIS 501.

**Recommended Background:**
None.

**Corequisites:**
None

**Restrictions:**
Restricted to students in the PhD in BHI program.

**Credit Restrictions:**
None.

**Credit Hours:**
4 hours.

**Type of Instruction:**

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<thead>
<tr>
<th>Type of Instruction</th>
<th>Contact Hours/Week Over 15-Week Term</th>
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<tbody>
<tr>
<td>Discussion</td>
<td>4</td>
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**Grading Mode:** Normal

**Sign-Offs:**
To be forwarded for review, sign-off, and comment to the following administrators:

*Chairperson(s) or director(s) of department(s) or unit(s):*
None

*Dean(s) of college(s) or school(s):*
None

*Comments related to request for sign-off:*
None

**Frequency of Offering:**

*Frequency*
Spring of every year.

*Special Notes*

**Special Technology or Equipment Support Request:**
None

**Faculty Proposer(s):**
Annette L. Valenta and Michael Dieter

**PRIMARY DEPARTMENT APPROVAL STATUS**

**APPROVED** for Biomedical and Health Information Sciences by Larry Pawola, Department Head on 10/1/2014 1:48:10 PM

**PRIMARY COLLEGE APPROVAL STATUS**

**APPROVED** for Applied Health Sciences by Joelle Livermore Lantz, Assistant Dean on 11/19/2014 11:56:04 AM

**Comments:**
OFFICE OF VICE CHANCELLOR FOR ACADEMIC AFFAIRS APPROVAL STATUS
NOT YET APPROVED