

**University of Arkansas for Medical Sciences
Office of the University Registrar
GUS Course Catalog Form**

This form should be used for courses offered at UAMS. If a course addition will change the curriculum for one or multiple degree plans, you will be asked to update a curriculum template for each degree program affected. Please remember to submit a copy of the syllabus with this form.

Course Changes and Additions Submission Timeline

Fall Semester February 1st (same calendar year)
Spring Semester September 1st (preceding calendar year)
Summer Semester December 1st (preceding calendar year)

This request is for a: New Course Course Change Course Retirement (skip to p. 4)

College: Graduate School

Department/Program: Biomedical Informatics

Course Title: Introduction to Biomedical Informatics

Course Description: This course provides an introduction and overview of the discipline of biomedical informatics. The student is introduced to key application areas within the discipline, as well as thought leaders, key events and major issues in information and computer use in Biomedicine.

Course Instructor: Meredith Zozus, PhD

Course Instructor Email: MNZozus@uams.edu Course Instructor Phone: (501) 603-1766

Additional Instructors: None

[Click here to enter additional instructor names and email addresses](#)

[Click here to enter additional instructor names and email addresses](#)

GENERAL COURSE INFORMATION

First term course will be offered/changed: Fall Spring Summer

First year course will be offered/changed: 2017

Meeting dates differ from standard semester? Yes No

If yes, describe meeting pattern: (i.e. last 4 weeks of semester, 8 Wednesdays beginning 2nd week, etc.)

Grading Basis: Letter Grade Number of Units: 3

If Variable Credit, list the maximum number of units: *Choose an item.*

Component Type: *Lecture*

Repeat for credit? Yes No

If yes, limit to number of enrollments allowed per student: No limit

Preferred Catalog Number: *Click here to enter text.*

*Note: Preferred Catalog Numbers are not guaranteed to be used.

ENROLLMENT CONTROLS

PREREQUISITES

| Subject Area | Catalog # | Course Title | Course ID (if known) |
|-------------------|------------------|---------------------|----------------------|
| None. | <i>Catalog #</i> | <i>Course Title</i> | <i>Course ID</i> |
| <i>Subj. Area</i> | <i>Catalog #</i> | <i>Course Title</i> | <i>Course ID</i> |
| <i>Subj. Area</i> | <i>Catalog #</i> | <i>Course Title</i> | <i>Course ID</i> |
| <i>Subj. Area</i> | <i>Catalog #</i> | <i>Course Title</i> | <i>Course ID</i> |

CO-REQUISITES

| Subject Area | Catalog # | Course Title | Course ID (if known) |
|-------------------|------------------|---------------------|----------------------|
| <i>Subj. Area</i> | <i>Catalog #</i> | <i>Course Title</i> | <i>Course ID</i> |
| <i>Subj. Area</i> | <i>Catalog #</i> | <i>Course Title</i> | <i>Course ID</i> |
| <i>Subj. Area</i> | <i>Catalog #</i> | <i>Course Title</i> | <i>Course ID</i> |
| <i>Subj. Area</i> | <i>Catalog #</i> | <i>Course Title</i> | <i>Course ID</i> |

Please list any other non-course prerequisites attached to this course (e.g. minimum GPA, exam, year in program)
None.

Minimum Number of Students to Enroll: None
Maximum Number of Students who may Enroll: None

Is enrollment in this course limited to certain groups of students (i.e. PhD students only)? Yes No

Please describe enrollment limits by groups: None.

Is advisor or instructor consent required for students to take this course? Instructor Consent

INSTRUCTION MODE

Please provide information about the first semester this course will be offered. You will have the opportunity to change this information if this form is provided prior to the last date for scheduling requests.

INSTRUCTION INFORMATION

Instruction Mode: *Online - 51-4% some face/face*

FOR ONLINE COURSES ONLY: Will this course be offered to students out of state? Yes No

Please select all locations where this course will be taught:

Main Campus

Northwest Campus

UAMS Southwest

Other

If "Other" Location, please describe: *Click here to enter text.*

EXAM AND PROGRESSION

Will the course have a final exam? Yes No

Will the final exam occur during the normally scheduled course time? Yes No

Is there a minimum grade required for the student to progress? Not Required

ADDITIONAL INFORMATION

Are any degrees affected by this course addition? Yes No

If "Yes," please list all degrees affected by this change: *Click here to enter text.*

Does this course address/include:

Service Learning¹:

Partially

100%

Does not address

Inter-professional Education² (IPE)

Partially

100%

Does not address

Cultural competency³

Partially

100%

Does not address

Patient-Family Centered Care⁴

Partially

100%

Does not address

Interdisciplinary Education⁵

Partially

100%

Does not address

ADDITIONAL INFORMATION:

Click here to enter text.

¹ A structured learning experience that combines community service with preparation and reflection. Students engaged in service-learning provide community service in response to community-identified concerns and learn: the context in which the service is provided, the connection between their service and their academic coursework, and their roles as citizens.

² Defined as students of two or more professions engaged in learning with, from and about each other.

³ An ability to interact effectively with people of different cultures and ethnic backgrounds. Comprises four components: Awareness of one's own cultural worldview, attitude towards cultural differences, knowledge of different cultural practices and worldviews, and cross-cultural skills. Developing cultural competence results in an ability to understand, communicate with, and effectively interact with people across cultures.

⁴ An approach to the planning, delivery, and evaluation of health care that is grounded in mutually beneficial partnerships among health care providers, patients, and families. It redefines the relationships in health care. The core concepts include: Dignity and respect, information sharing, participation, and collaboration.

⁵ Defined as the degree to which individuals have the capacity to obtain, process and understand basic health information and services need to make appropriate health decisions.

COURSE RETIREMENT ONLY – Course Additions and Changes can skip to pg. 5

College: *Choose an item.*

Department/Program: *Click here to enter text.*

Course Title: *Click here to enter the current title.*

Catalog Name and Number: *Click here to enter text.*

Course ID (if known): *Click here to enter text.*

What semester and year will this course be retired? *Click here to enter text.*

Are any degrees affected by this course retirement? Yes No

If "Yes," please list all degrees affected by this change (updated Curriculum Templates for any degree that will change as a result of this retirement are required to be submitted to the Office of the University Registrar):

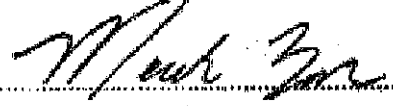
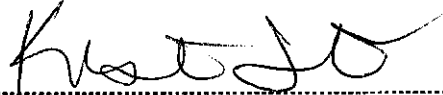
Click here to enter text.

ADDITIONAL INFORMATION:

Click here to enter text.

APPROVALS

Proposal will not be processed without all required signatures.

| | |
|---|------------------------------------|
|  Course Instructor signature | Meredith Zozus, PhD |
|  Associate Dean signature | Enter Associate Dean Name |
| Today's Date: September 9, 2016 Preparer's Email: twilliams@uams.edu | Preparer's Name: Tremaine Williams |

Please submit this form and a copy of the syllabus to:

Angela Wilson, Registrar
Email: awilson5@uams.edu
Mail Slot #767
Questions? 501-526-6612

| | |
|---|-------------------------|
| Office use only Received: _____ Entered into GUS <input type="checkbox"/> Entered into Schedule of Courses <input type="checkbox"/> Curriculum Registrar Initials: ____ Schedule Registrar Initials: ____ | Notes/Follow-up: |
|---|-------------------------|

SYLLABUS

COURSE NUMBER: BIOM XXXX
COURSE TITLE: Introduction to Biomedical Informatics
CREDIT HOURS: 3
PROPOSED SEMESTER: Spring 2017

COURSE DESCRIPTION:

This graduate course provides an introduction and overview of the discipline of biomedical informatics. The student is introduced to key application areas within the discipline, as well as thought leaders, key events and major issues in information and computer use in Biomedicine. Consent of instructor required.

COURSE OBJECTIVES:

Upon successful completion of this course, the student is able to:

Articulate the scope, goal, and definition of Biomedical Informatics as a discipline and of professions within the discipline based on accepted frameworks

Describe the impact of historical seminal contributions to Biomedical Informatics

Apply ten cross-cutting theories or principles to addressing one or more major challenges facing Biomedicine

Examine the goals and focus of major Biomedical Informatics organizations and journals.

Engage in critical reflection of ones strengths and interests in relation to major Biomedical Informatics roles.

PRE-REQUISITES: None

ATTENDANCE: Attendance is required for all classes. Excused absences may be obtained only by permission from the course director. Make-up exams will only be given under the most extenuating circumstances.

STUDENT EVALUATION:

A letter grade will be assigned a based on student achievement and participant in weekly assignments.

COURSE EVALUATION: At the end of the course, students will be provided with a Course Evaluation Form to anonymously assess the content and delivery of the course. Faculty will assess the course each term and make any appropriate modifications and updates.

TEXTBOOKS:

Edward H. Shortliffe (Editor), James J. Cimino (Editor) 2013 Biomedical Informatics: Computer Applications in Health Care and Biomedicine (Health Informatics).

A History of Medical Informatics in the United States, 1950 to 1990 by Morris F. Collen.

GENERAL INFORMATION

SEMESTER: Spring 2017, Fall as needed,

LOCATION: Campus and Online (hybrid)

COURSE DIRECTOR: Meredith Zozus

SPECIAL ASSISTANCE: Students who believe they may need accommodations in this class based on mental or physical impairments must contact the Students with a disability that need accommodations should contact the Associate Dean for Academic Affairs at (501) 686-5730 to schedule an appointment to discuss your needs. Please make arrangements as soon as possible so accommodations can be made in a timely manner.

MAJOR TOPICS:

Introduction to the Discipline

Definition of Biomedical Informatics as a discipline
Careers and Professional organizations in Biomedical Informatics
History of Biomedical Informatics
Ethics in Biomedicine
Major challenges in Biomedicine

Computer Systems in Biomedicine

Computer systems, networks and architecture
Information systems lifecycle concepts and software engineering basics
Privacy and Security
More's, Metcalf's, and Zpif's laws
Interoperability

Cross-cutting Concepts, Principles and Theories

Fundamentals of Data, Information, and Knowledge
Data lifecycle concepts

Semiotics and Representation Theory
Survey of representational formalisms (terminology, data elements, ontology, data models)
Characterizing tests and information retrieval (sensitivity, specificity, ROC, etc.)
Extracting knowledge from data (data and text mining, machine learning, Artificial Intelligence)

TENTATIVE COURSE OUTLINE:

- Week 1 Introduction to the discipline of Biomedical Informatics
Assignment: Present a 4-5 slide overview of your assigned History chapter. Describe the theories and pioneering people and systems, application area or BMI challenge addressed, and how the advance achieved the Fundamental Theorem.
- Week 2 Computer systems, architecture, networks, interoperability and security
Assignment: Boolean logic/logic diagram problems
- Week 3 Semiotics, Data, Information, and Knowledge (declarative and procedural), Data lifecycle concepts
Assignment: Decompose the knowledge in your assigned domain into declarative versus procedural knowledge.
- Week 4 Controlled terminology, data elements, ontology, data models
Assignment: On one page list the main data elements and controlled terminology for your assigned domain. On a second page, draw a data model that could be used to store the data. On a third page, describe any applicable knowledge sources. On a fourth page describe an alternate representation.
- Week 5 Relational Data Model, relational databases including data warehouses, and SQL
Assignment: Create a relational data model for the data from last week's assignment. Show all referential integrity through primary or foreign key relationships.
- Week 6 Non-relational data models
Assignment: Describe a non-relational model alternative to your last week's assignment.
- Week 7 Data quality and data quality assessment in Biomedicine
Assignment: Create a one-page data quality assessment plan for your domain.
- Week 8 Characterizing tests (Sensitivity, Specificity, PPV, NPV, ROC curve)
Assignment: Work example problems.
- Week 9 Information systems lifecycle concepts (needs assessment, software selection, testing, implementation, evaluation, maintenance, migration, decommissioning, downtime)

- Week 10 Information systems lifecycle continued
Assignment: Complete the self assessment questions for this and last week's content.
- Week 11 Software engineering basics (UML, source control, software QA, development models)
Assignment: create and post your assigned UML diagram package for the described ePrescribing system.
- Week 12 Information retrieval
Assignment: Work example problems.
- Week 13 Extracting knowledge from data (data mining, text mining, and NLP)
- Week 14 Extracting knowledge from data continued (machine learning)
Assignment: For a given information need and source data, match appropriate KE techniques.
- Week 15 Application of knowledge through computers: Artificial Intelligence
Assignment: Complete the self assessment questions

Course Approval Form

6. Program Approvals:

Fred Prior, PhD
(Print or type) Chairperson, Academic Department or Area

[Signature] 9/2/16
(Signature) Chairperson, Academic Department or Area Date

[Signature] 10-20-16
College Dean (Dean McGehee for College of Medicine) Date

7. Graduate School Approvals

[Signature] 10/20/16
Chairperson, Graduate Council Date

[Signature] 10-20-16
Dean of the Graduate School Date