COURSE APPROVAL FORM, Graduate School
University of Arkansas for Medical Sciences

This form and attached materials are due in the Graduate School Office on the first Monday of the month. All forms will be submitted to the UAMS Graduate Council Curriculum Committee for review and approval prior to consideration by the Graduate Council.

This form is not required for minor stylistic or editorial corrections to the title or course descriptions. These may be made when revising the catalog copy.

1. **Program:** Department of Biomedical Informatics | D | B | M | I | | | | | (Department / Alpha (Department) Code)

2. **Action proposed** (indicate one or more items): Effective term: Spring 2019

■ Add course	☐ Change title		
☐ Eliminate course (No outline needed)	☐ Change credit hours from:	_____	to _____
	☐ Change course number from:	_____	to _____
	☐ Change description		

3. **Course ID, title and description:**

B	M	I	G	5	0	0	3
prefix				number			

Computational Methods (title, 20 characters)

Computational Methods in BMI (catalog name, 40 characters)

Scheduled offering: ☐ Fall ☒ Spring ☐ Summer ☒ On demand

To cross list a course, use the Course Cross Listing Form.

Describe the course in sentence form using 50 words or less **as it is to appear in the catalog**. List prerequisites, co-requisites and possible off-site instructional opportunities or requirements.

This course is an introduction to the range of computational tools and techniques often used by Biomedical Informaticists. The course focuses on a series of hands-on exercises designed for the student to gain a basic knowledge of those tools, principles, and techniques demonstrating the basic computational competencies needed.

4. **Justification:**

Justify this change in terms of course needs or curriculum improvement. State the effect of this change on any degree programs. Identify the courses to be eliminated, if any, if this course is approved. (Course Approval Forms must also be submitted for these courses) Identify any existing course or courses that would extensively overlap or be duplicated if the proposed curricular change occurs. Provide statements of concurrence with the change from the chairperson(s) and dean(s) of the programs/areas offering the affected courses.

All degree-seeking BMI students regardless of track must successfully pass this Biomedicine for Informaticists course, or independently demonstrate their competence in these concepts (e.g. through passing the course exams).

INSTRUCTIONS FOR COMPLETION OF THE UAMS GRADUATE SCHOOL COURSE APPROVAL FORM

1. Please save this PDF to your computer for editing.

2. The form has been designed with fields for your responses, and these are indicated in blue and gray shading. Please complete all fields. Use the "tab" key to move between fields. A 'beep' will sound if you attempt to enter a response that contains more characters than is permitted. IF YOU NEED HELP IN ANY OF THE FIELDS, PRESS THE F1 KEY AND A HELP WINDOW WILL OPEN.

3. Print the document, and then obtain the appropriate signatures before submitting the form to the Graduate Office.

SYLLABUS

COURSE NUMBER: BMIG 5003

COURSE TITLE: Computational Methods in Biomedical Informatics

COURSE DESCRIPTION:

This course is an introduction to the range of computational tools and techniques often used by Biomedical Informaticists. The course focuses on a series of hands-on exercises designed for the student to gain a basic knowledge of those tools, principles, and techniques demonstrating the basic computational competencies needed for graduate study in Biomedical Informatics. This course consists of lecture coupled with lab assignments and covers the practical aspects of how computational sciences are used in Biomedical Informatics.

All degree-seeking BMI students regardless of track must successfully pass the Computational Methods in Biomedical Informatics course, or independently demonstrate their competence in these tools (e.g. through passing the course exams).

PRE-REQUISITES: None

GENERAL INFORMATION:

CREDITS:	3 credit hours
SEMESTER:	Spring 2019
LOCATION:	Campus and Online (hybrid)
FACULTY:	Lawrence Tarbox, PhD
SPECIAL ASSISTANCE:	Students who believe they may need accommodations in this class based on mental or physical impairments must 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:

Computer Systems in Biomedicine (or is this in other courses?)

Computer systems, networks and architecture
High Performance and Cloud computing: - tool: Viewpoint/Moab/Torque
Information systems lifecycle and software engineering concepts – tool: imphub

Knowledge acquisition
Interoperability (part of foundation?)

From Representation to Computation: Algorithmic Thinking

Automata Theory (State Machines) tool: JFLAP (free download)
Rules engines tool: CLIPS (free download)
Bayesian Network tool: UnBBayes
Text processing and Natural language processing tool: TBD
Computational phenotyping in clinical data tool: SQL
Process simulation tool: AnyLogic (free download)

Computer-aided Human Use of Data in Biomedicine

Data Dependent Decision support
- Signal detection (alert and visual perception)
- Action suggestion
- Provision of targeted decision resources (Text IR, aggregate data, visualization)

Task and Process Automation (data handling and automation based on data)

EVALUATION:

This is a graded course. Grades will be assigned separately for the didactic and lab portion of the course based on the course average according to the following scale: A (93-100), B (85-92), C(75-84), D(65-74), Fail (lower than 64).

The course average for the didactic portion of the course will be comprised of course assignments, weekly quizzes, the course project, and the final exam. The didactic portion of the course represents three of the four credit hours.

Assignments.....10%
Weekly quizzes.....20%
Course project.....20%
Final exam.....25%
Lab 25%

The grades for the assignment, weekly quiz, and lab portions of the course will be averaged and evenly weighted. The lab portion of the course represents one of the four credit hours, thus, one fourth of the course grade.

ACADEMIC HONESTY:

Academic honesty is expected at all times. All graded work must be your own unless otherwise specified in the assignment. Fair credit must be given to others for their work on team assignments by including a statement of contributorship (see ICMJE guidelines for authorship).

Academic dishonesty such as but not limited to cheating, plagiarism, using the work of others without permission and acknowledgement and forgery will result in an automatic zero for the assignment and may result in a failing grade in the course, loss of graduate funding and dismissal from your degree program.

5. Program Approvals:

Fred Prior, PhD, Deparment of Biomedical Informatics
(Print or type) Chairperson, Academic Department or Area

Fred Prior 04/30/2018
(Signature) Chairperson, Academic Department or Area Date

5-17-2018
College Dean (Dean McGehee for College of Medicine) Date

6. Graduate School Approvals

M. MacNich 5/17/18
Chairperson, Graduate Council Date

5-17-2018
Dean of the Graduate School Date

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: Department of Biomedical Informatics

Course Title: Computational Methods in Biomedical Informatics

Course Description: This course is an introduction to the range of computational tools and techniques often used by Biomedical Informaticists. The course focuses on a series of hands-on exercises designed for the student to gain a basic knowledge of those tools, principles, and techniques demonstrating the basic computational competencies needed for graduate study in Biomedical Informatics. This course consists of lecture coupled with lab assignments and covers the practical aspects of how computational sciences are used in Biomedical Informatics.

Course Instructor: Lawrence Tarbox, PhD

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

Additional Instructors: Click here to enter additional instructor names and email addresses

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: 2019

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: BMIG 5003

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

ENROLLMENT CONTROLS

PREREQUISITES

Subject Area	Catalog #	Course Title	Course ID (if known)
Subj. Area	*Catalog #*	*Course Title*	*Course ID*
Subj. Area	*Catalog #*	*Course Title*	*Course ID*
Subj. Area	*Catalog #*	*Course Title*	*Course ID*

CO-REQUISITES

Subject Area	Catalog #	Course Title	Course ID (if known)
Subj. Area	*Catalog #*	*Course Title*	*Course ID*
Subj. Area	*Catalog #*	*Course Title*	*Course ID*
Subj. Area	*Catalog #*	*Course Title*	*Course ID*
Subj. Area	*Catalog #*	*Course Title*	*Course ID*

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: no min
Maximum Number of Students who may Enroll: no max

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

Please describe enrollment limits by groups: *Click here to enter max enrollments.*

Is advisor or instructor consent required for students to take this course? No consent required

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 - 75-99% 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 Learning[1]:	Partially ☐	100% ☐	Does not address ☒
Inter-professional Education[2] (IPE)	Partially ☐	100% ☐	Does not address ☒
Cultural competency[3]	Partially ☐	100% ☐	Does not address ☒
Patient-Family Centered Care[4]	Partially ☐	100% ☐	Does not address ☒
Interdisciplinary Education[5]	Partially ☒	100% ☐	Does not address ☐

ADDITIONAL INFORMATION:

Click here to enter text.

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[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):

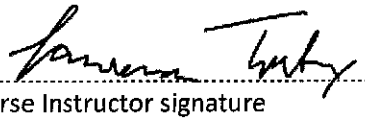
Click here to enter text.

ADDITIONAL INFORMATION:

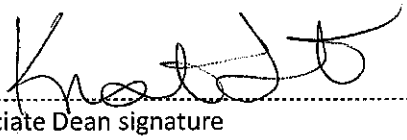
Click here to enter text.

APPROVALS

Proposal will not be processed without all required signatures.



Course Instructor signature — Lawrence Tarbox, PhD



Associate Dean signature — Kirsten Sterba, PhD

Today's Date: April 26, 2018 — Preparer's Name: Tremaine Williams

Preparer's Email: tbwilliams@uams.edu

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	**Notes/Follow-up:**
Received: _____	
Entered into GUS ☐	
Entered into Schedule of Courses ☐	
Curriculum Registrar Initials: ___	
Schedule Registrar Initials:___	