



Health Informatics, MAS

Student Handbook
2023-2024 Catalog

ASU Charter

ASU is a comprehensive public research university, measured not by whom we exclude, but rather by whom we include and how they succeed; advancing research and discovery of public value; and assuming fundamental responsibility for the economic, social, cultural and overall health of the communities it serves.

Justice, Equity, Diversity and Inclusion at the College of Health Solutions

At the College of Health Solutions, we are focused on improving the health of the communities we serve. Every student, every faculty and staff member, every individual and community member should have the opportunity for better health throughout their lifespan. To improve health, we must embrace and support greater diversity, equity and inclusivity in everything we do, including teaching, research and service. We are committed to doing better. You are welcome at the College of Health Solutions, and this is what you can expect from us.

Commitments to Justice, Equity, Diversity and Inclusion

We create leaders who advance the principles of justice, diversity, equity and inclusion, shaping a future in which all community members can fully realize their potential.

We embed diversity, equity and inclusion as a transformational force in every aspect of our teaching, research and service as we work to address the challenges facing people and communities to stay healthy, improve their health and manage chronic disease.

We believe that diversity and inclusion are essential for excellence and innovation, and thus it is stated in our college values: We maximize opportunities for people of diverse backgrounds, abilities and perspectives.

We support underrepresented and historically marginalized groups and will not tolerate discrimination or hate of any kind.

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Introduction

Welcome

Welcome from the biomedical informatics faculty at the College of Health Solutions!

This handbook is a guide for prospective and current graduate students in Health Informatics. The handbook provides an initial resource for answers to questions about the program, but additionally students are also encouraged to consult with the graduate support coordinator for any additional questions about the program.

Graduate College requirements define the basic policies for obtaining a degree from ASU, these policies can be found on the ASU Graduate College website located here. Additionally, Health Informatics has several additional requirements which are identified in this handbook.

Vision and mission

The Master in Advanced Studies in health informatics provides training to an inclusive, multicultural, and multidisciplinary group of students. Our program affords students with fundamental and practical learning opportunities in the application of innovative informatics solutions in healthcare and population health. Through our program, we provide students with theoretical and applied knowledge in health informatics that they can employ for the betterment of the health outcomes from individuals to communities.

Program overview

The Master of Advanced Studies (MAS) in health informatics was originally designed to offer professionals working in the field of health care an opportunity to earn a master-level degree on the use of information technology, data science, and knowledge representation to impact health and health care. The degree evolved to be an inclusive multicultural, multidisciplinary program that includes students with many different background and experiences in healthcare from student without health care experience to expert in healthcare that would like to advance their career as health informatics expert. Professionals in health and non-health fields acquire the fundamental knowledge and skills to transition to health informatics careers in this rapidly expanding field.

Core courses provide a background in health informatics, leadership theories and skills to lead and implement health informatics solutions, and the communication skills necessary to convey this complex information to a variety of audiences. While electives allow one to focus in the areas of clinical informatics, modern health information technology, and skills with data analysis, the degree prepares graduates to enhance their skills for careers in a wide range of healthcare settings.

Health informaticians work to develop and/or implement novel information technology for healthcare, computer science and knowledge management methodologies for disease prevention, treatment, more efficient and safer patient care delivery and decision support systems. This field requires interdisciplinarity teamwork, and close collaboration with clinicians, biomedical and computational scientists, knowledge management professionals, educators and health care consumers.

The MAS program is formatted to meet the needs of working professionals. It is offered entirely online and can be taken full-time or part-time. Courses are offered in condensed 7.5-week sessions. The degree plan is 30 credits including: 15 credits of Core Coursework, 12 credits of Electives, and 3 credits of Applied Project for the culminating experience.

Program contacts

Program director: Marcela Aliste, marcela.alistegomez@asu.edu

Graduate support coordinator: Jill Atwood, chsgrad@asu.edu

Program faculty: see [Appendix A](#)

Admission

Admission to the Health Informatics, MAS is available for Fall and Spring terms. Deadlines to apply can be found [here](#). The final application deadlines are in place to ensure students will be processed in time for the application term. Applications will be reviewed by the admissions committee only once all materials have been received. Application status can be monitored in MyASU. Official admission decisions will be emailed to the student.

Quick Facts:

- Location: Online
- Start terms: Fall, Spring
- Time to completion: 1.5 years

Graduate admission requirements

ASU maintains minimum standards for consideration for admission to graduate programs. The program may establish requirements in excess of those established by the university.

- An earned bachelor's degree or higher from a regionally accredited institution in the U.S., or the equivalent of a U.S. bachelor's degree from an international institution officially recognized by that country.
- A minimum grade point average of 3.00 (scale is 4.00 = "A") in the last 60 semester hours or 90 quarter hours of undergraduate coursework is required to be considered for admission to an ASU graduate degree program.
- International applicants must provide proof of English proficiency. For more information, visit the admissions [website](#).

Academic program requirements

In addition to the graduate admission requirements, the program requires the following as part of the application:

Undergraduate or graduate degrees– bachelor's or master's degree, in a related field such as biology, computer science, medicine, nursing, pharmacy or public health from a regionally accredited institution.

English proficiency – test scores must be from within two years of anticipated program start date.

Statement of purpose – max of 500 words, indicate interest in program, what you hope to accomplish, and career goals.

Two letters of recommendation – must be from current or former professors or supervisors of related work experience.

Resume or curriculum vitae – include related experiences and complete educational background in order of attendance; indicate GPA scale or context for grading system of international universities, if applicable.

Provisional acceptance guidelines

In some instances, a student may be admitted provisionally and/or with a deficiency. Students should refer to the official admission letter sent by the Graduate College via MyASU to determine if they have been admitted with a provision and/or deficiency.

A provisional admission requires a student to maintain a 3.0 or higher GPA within a specified timeframe. If the 3.0 is not achieved by the end of the timeframe specified on the official admission letter, the student will be automatically dismissed from the degree program.

A deficiency requires a student to fulfill a competency area within a given timeframe. The academic program will monitor students with deficiencies. If a deficiency is not completed within the timeframe indicated on the official admission letter, the student may be recommended for dismissal from the academic program.

Pre-admission credit policy

Credit hours completed at ASU or at another regionally accredited U.S. institution or international institution officially recognized by that country, before the semester and year of admission to an ASU graduate degree program, are considered pre-admission credits. With the approval of the academic unit and the Graduate College, students may include a maximum of 12 graduate-level credit hours with grades of “B” or better that were not used toward a previous degree. Preadmission credits must have been taken within three years of admission to the ASU degree or certificate program to be accepted. Official transcripts must be sent to Graduate Admission Services from the records office of the institution where the credits were earned.

Tuition and assistance

Tuition and fees

Tuition is set by ASU and the Arizona Board of Regents each year. View the general [Tuition and Fees Schedule](#), or calculate a more specific estimate of charges using the [ASU Tuition Estimator](#). Information on residency requirements can be found at [Residency for Tuition Purposes](#).

The Health Informatics, MAS has a program fee of \$350 per credit.

Financial assistance

Financial assistance is available through a variety of sources, including:

- College of Health Solutions [scholarships](#)
- Graduate College [fellowships](#)
- Traditional financial aid (loans and grants). Visit the [Financial Aid website](#).

Travel assistance

Financial assistance for travel related to conferences, workshops, or training related to a student's graduate program are available through several resources.

- Graduate College [travel awards](#)
- Graduate and Professional Student Association [travel grants](#)
- College of Health Solutions [student conference support](#)

Curriculum and graduation requirements

Program requirements

The Health Informatics, MAS is comprised of 30 credits, including an applied project.

Required Core (15 credits)

- BMI 601 Fundamentals of Health Informatics (3)
- BMI 603 Health Informatics Database Modeling and Applications (3)
- BMI 604 Health Information Communication (3)
- BMI 614 Current Perspectives in Health Informatics (3)
- HCD 575 Leadership and Professionalism (3)

Electives (12 credits)

- BMD 502 Foundations of Biomedical Informatics Methods I (3)
- BMD 511 Health Economics, Policy, and Payment Models (3)
- BMD 562 Bioethical Issues in Applied Biomedicine (3)
- BMI 515 Applied Biostatistics in Medicine and Informatics (3)
- BMI 517 Adv Biostatistics Biomed Research and Health Care (3)
- BMI 598 Topic: Knowledge Management and Engineering (3)
- BMI 598 Topic: Imaging in Diagnostics (3)
- BMI 598 Topic: Telemedicine (3)
- BMI 608 Project Management for Interdisciplinary Teams (3)
- BMI 613 Workflow Analysis and Redesign in Health Systems Engineering (3)
- BMI 616 Clinical Decision Support and Evidence-Based Medicine (3)

Culminating Experience (3 credits)

- BMI 593 Applied Project (3)

Note: A grade of B or better is required in BMI 593.

No 400-level coursework may be used toward the requirements of this program.

Electives

Elective courses other than those indicated in this handbook cannot be used on an iPOS unless approval is received *before* enrolling in the course. The following procedure should be followed for students who wish to take outside electives:

1. The student should prepare a written request to the graduate support coordinator which includes: a course syllabus, the semester the student plans to take the course, and how the course enhances the student's plan of study.
2. The graduate support coordinator will work with the program director and Academic Programs Committee (APC) to consider the elective coursework, and notify the student of the decision.

In the event additional pre-approved elective options are made, students will be notified by the program via email or Canvas announcement.

Applied project

To complete the MAS in Health Informatics, all students must complete a final culminating experience (BMI 593 Applied Project). A grade of B or better must be earned in BMI 593.

Prior to registration, you must complete an electronic form which lists your mentor(s), main goal(s), area in health informatics to be studied, and contains an abstract of your proposed project. This form must be signed and returned to the applied project coordinator.

The applied project coordinator will serve as instructor for the BMI 593 Applied Project course. Students who choose to complete their project external of ASU will require a preceptor (site mentor) and approval of the applied project coordinator. Students who decide to work with a program faculty will have that faculty member be their advisor (mentor).

Different deliverables will be required, including a project plan with SMART goals, type of project, progress reports and project updates. Throughout the course of the Applied Project, you will be expected to submit to the applied project coordinator, with the approval of your advisor. Should any issues arise that may jeopardize the timely completion of the project, it is important that you communicate immediately to both your advisor and the applied project coordinator. Students **cannot** re-use previous work from other courses or experiences for the Applied Project (see [Academic Integrity](#)).

The project itself can range from pure literature research (e.g. literature review; perspectives) to data analytics to the clinical setting (e.g. clinical workflow, surveys for clinicians or patients). The project must be related to health informatics, which is very broad and interdisciplinary. Students should start thinking about interests and future project ideas as they go through classes to consider potential faculty advisors and project topics. It is recommended that students contact the applied project coordinator at least three months before the Applied Project semester to ensure a successful and timely project start.

The final format of the Applied Project is to be a business report or a journal article section, depending on the individual project. Students must receive a B or better in the BMI 593 course to be eligible for graduation.

Application to graduate

Students should [apply for graduation](#) during the semester of planned graduation and must apply no later than the [deadline specified](#) for that term. Students must have an approved iPOS on file before applying for graduation.

Plan of study

To graduate in a timely manner, students should follow a recommended plan of study. Deviation from a plan of study should be discussed with the graduate support coordinator and program director. Failure to follow a plan of study may result in delayed graduation.

Plan of Study, Fall Start

Term/ Session	Course	Credits
Year 1 - Fall A	BMI 601 Fundamentals of Health Informatics <i>Note: Must take BMI 601 in first term</i>	3
	Elective	3
Year 1 - Fall B	BMI 603 Health Informatics Database Modeling & Applications	3
	Elective	3

Year 1 - Spring A	HCD 575 Leadership & Professionalism	3
	Elective	3
Year 1 - Spring B	BMI 604 Health Information Communication	3
	Elective	3
Year 2 - Fall	BMI 593 Applied Project	3
	BMI 614 Current Perspectives in Health Informatics <i>Note: BMI 614 and 593 must be taken simultaneously in the last term.</i>	3

Plan of Study, Spring Start

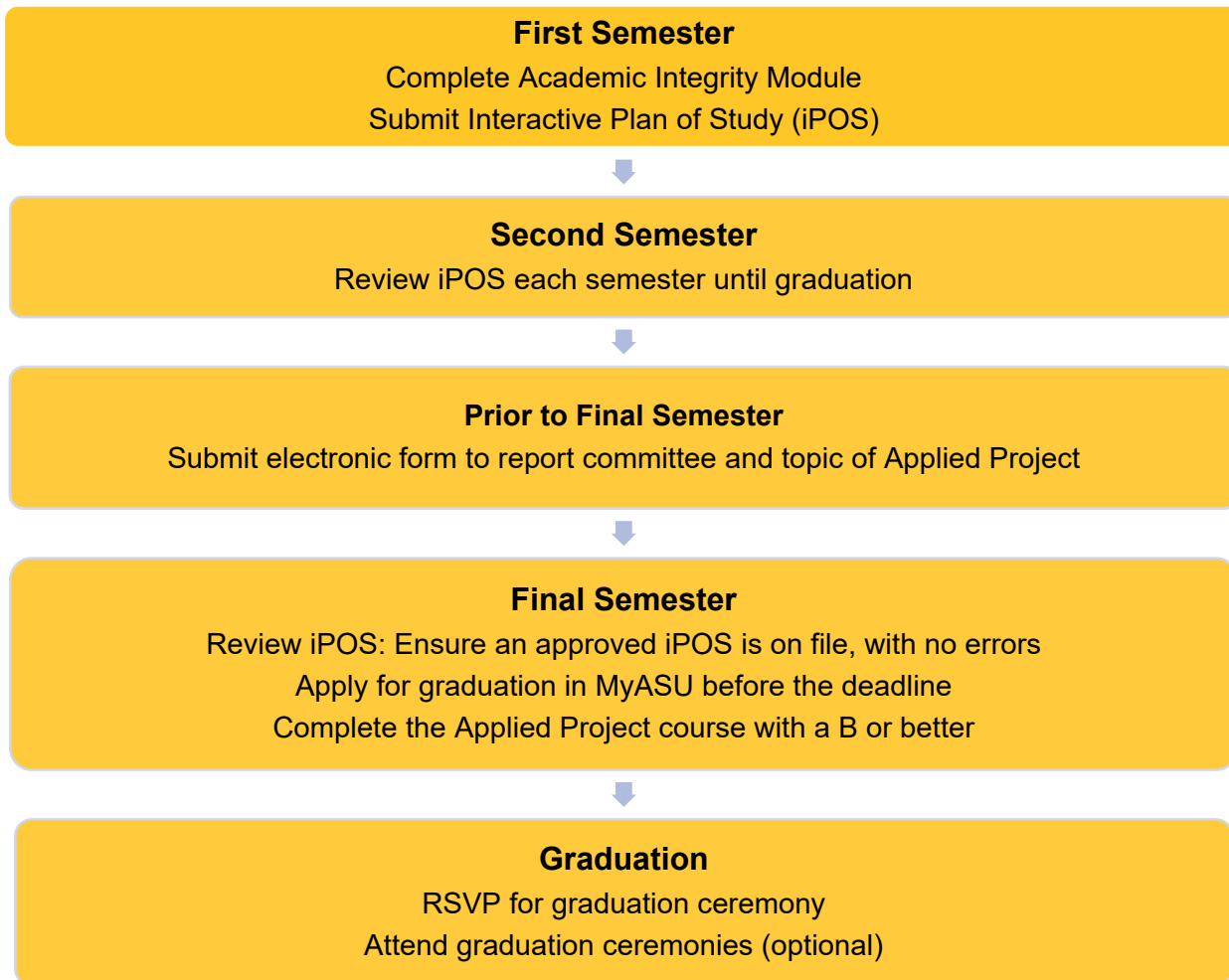
Term/ Session	Course	Credits
Year 1 - Spring A	BMI 601 Fundamentals of Health Informatics <i>Note: Must take BMI 601 in first term</i>	3
	HCD 575 Leadership & Professionalism	3
Year 1 - Spring B	BMI 604 Health Information Communication	3
	Elective	3
Year 2 - Fall A	Elective	3
	Elective	3
Year 2 - Fall B	BMI 603 Health Informatics Database Modeling & Applications	3
	Elective	3
Year 2 - Spring	BMI 593 Applied Project	3
	BMI 614 Current Perspectives in Health Informatics <i>Note: BMI 614 and 593 must be taken simultaneously in the last term.</i>	3

Electives offering schedule

Course	Term/Session
BMD 502 Foundations of Biomedical Informatics Methods I (3)	Fall B
BMD 511 Health Economics, Policy, and Payment Models (3)	Fall B
BMD 562 Bioethical Issues in Applied Biomedicine (3)	Summer
BMI 515 Applied Biostatistics in Medicine and Informatics (3)	Spring A
BMI 517 Adv Biostatistics Biomed Research and Health Care (3)	Fall A
BMI 598 Topic: Knowledge Management and Engineering (3)	Spring B
BMI 598 Topic: Imaging in Diagnostics (3)	Fall B, Spring B
BMI 598 Topic: Telemedicine (3)	Fall A
BMI 608 Project Management for Interdisciplinary Teams (3)	Fall B
BMI 613 Workflow Analysis and Redesign in Health Systems Engineering (3)	Fall B
BMI 616 Clinical Decision Support and Evidence-Based Medicine (3)	Spring A

**Subject to change, always check Class Search for scheduled courses.*

In addition to the required coursework, the steps to achieve a Master of Applied Science in health informatics are listed below. The program is designed to be completed in 1.5 years.



Interactive plan of study (iPOS)

The Interactive Plan of Study, or iPOS, is an agreement between the student, the academic unit, and the Graduate College. The iPOS must be submitted in the first semester of the program. Students are encouraged to review the iPOS at the end of each semester to ensure the courses listed on the iPOS match the student's transcript and that the courses meet the plan of study course requirements. More information on iPOS can be found [here](#).

Faculty advisor/chair: program director

Change of coursework: If a change of coursework is needed, the student must update the courses listed in the iPOS and submit a course change for review. This process is required if you projected a course you did not complete, or if you need to change courses listed. The iPOS will be routed electronically to the graduate support coordinator for review and approval, and then for auditing by the Graduate College.

Specializations and certifications

The College of Health Solutions prepares graduates for excellence upon entering the workplace. Since certification and licensure requirements vary by profession and from state-to-state, we recommend that you visit the [ASU licensure website](#) to determine if your program meets the requirements of individual state licensures or national certifications, as applicable. If you have specific questions, please contact your program director or degree coordinator.

Satisfactory academic progress

All graduate students are expected to make systematic progress toward completion of their graduate program. This progress includes satisfying the conditions listed below, and achieving the benchmarks and requirements set by the individual graduate programs as well as the Graduate College. If a student fails to satisfy the requirements of their program and/or the benchmarks outlined below, the student may be dismissed from their program based on the academic unit's recommendation to the Graduate College at which time the dean of the Graduate College makes the final determination.

Satisfactory academic progress includes:

1. Maintain a minimum 3.00 for all GPAs.
2. Satisfy all requirements of the graduate program.
3. Satisfy the maximum time limit for graduation for the student's graduate program (six years for masters and certificates, ten years for doctoral)
4. Successfully pass comprehensive exams, qualifying exams, foreign language exams, and the oral defense of the proposal/prospectus for the thesis or dissertation.
5. Successfully complete the culminating experience.
6. Graduate students must remain continuously enrolled in their graduate program. Failing to do so without a Graduate College approved Leave of Absence is considered to be lack of academic progress and may result in the Graduate College withdrawing the student from their program.

GPA and grades

Graduate students must maintain a minimum 3.00 (scale is 4.00 = "A") grade point average (GPA) to maintain satisfactory academic progress and to graduate. The minimum 3.00 GPA must be maintained on all GPA's (Plan of Study (iPOS) GPA, Overall Graduate GPA and Cumulative GPA):

1. The iPOS GPA is calculated on all courses that appear on the student's approved iPOS
2. Cumulative GPA represents all courses completed at ASU during the graduate career.
3. The Overall Graduate GPA is based on all courses numbered 500 or higher that appear on the transcript after admission to a graduate program or graduate non-degree. This includes shared coursework if in an approved accelerated bachelor's/master's program.

Transfer credits and some courses taken in the Sandra Day O'Connor College of Law are not calculated on in the iPOS GPA or the Graduate GPA. Courses lower than a "C" cannot appear on the iPOS but will be included when calculating the Graduate GPA. Courses with an "I" grade (incomplete) or "X" grade (audit) cannot appear on the iPOS.

University grade definitions and policies can be found [here](#).

The Health Informatics, MAS program requires a grade of B or better in BMI 593.

Incomplete grade requests

An incomplete grade request may be considered by an instructor when a student, who is doing otherwise acceptable work, is unable to complete a course (e.g., final exam or term paper) because of illness or other conditions beyond the student's control. Unfinished work must be completed with the same instructor except under extenuating circumstances. The completion date is determined by the instructor but may not exceed one calendar year from the date the mark of "I" is recorded. Once the work is completed, faculty must request a change on the grade roster to post the grade. If a student does not complete the missing coursework by the date that is agreed upon on the incomplete request form, the instructor may change the grade to what was earned based on the work completed in the class. If the coursework is not completed after a calendar year, the incomplete becomes permanent. Repeating a class in which an incomplete is awarded will not replace the "I" on the student's transcript. Students must complete the [incomplete request form](#) and submit it to their instructor for review and processing.

Academic probation and dismissal

Failure to maintain a minimum 3.0 GPA or failure to satisfactorily progress in the program as referenced in this handbook will result in the student being placed on academic probation. Students will be notified of probationary status and expectations for improvement by the program director or graduate support coordinator. Time limits for probationary status may vary. Typically, students have 9 credit hours or one year, whichever comes first, to raise their GPA.

Students who fail to meet requirements or timeline needed to demonstrate satisfactory improvement will be recommended for dismissal from the program. Notice will be provided by the program and will include procedures for appeal.

Time to completion limit

All work toward a master's degree must be completed within six consecutive years. Graduate courses taken prior to admission that are included on the Interactive Plan of Study must have been completed within three years of the semester and year of admission to the program. The six-year period begins with the term of admission to the program OR the earliest term of applied pre-admission credit.

Any exception to the time limit policy must be approved by the program director, the College of Health Solutions, and the dean of the Graduate College. The Graduate College may withdraw students who are unable to complete all degree requirements and graduate within the allowed maximum time limits.

Appeal and grievance processes

Grade appeal

Students who wish to discuss a grade concern during the term should contact the instructor first. If the issue is not satisfactorily resolved, the students should contact the program director.

The final grade appeal process may only be initiated by a student once the course has concluded and a final course grade has been posted to the student's transcript. Per university policy, grade appeals must be processed in the regular semester immediately following the issuance of the final grade in dispute (by commencement for fall or spring) regardless of whether the student is enrolled at the university.

The process begins with a discussion about the matter between the student and the course instructor. If the matter is unresolved, the student should submit a Grade Appeal Form for further review. If this review does not adequately settle the matter, the student should begin the formal procedure of appealing to the

College of Health Solutions Academic Standards and Grievance Committee. More information on all steps of this process can be found [here](#).

Student grievance

Students who wish to file a grievance about a non-grade-related matter may use the established procedure (more information can be found [here](#)). Non-grade-related grievances may include dissatisfaction with an instructor, problems with a classmate or other unresolved situations.

Appealing recommendation for dismissal

1. Students may appeal a decision for dismissal from the program by submitting a letter to the program director.
 - a. The appeal letter must be received within 10 business days of the date of the letter of dismissal. The letter should state the reasons justifying a reversal of the original decision and provide substantive evidence in support of the request.
 - b. Letters received after the 10 business-day interval will not be reviewed and the dismissal will be final.
 - c. The program committee will review all letters of appeal that are received within the 10 business-day time frame. The committee will submit their decision to the program director within 10 business days of receipt of the student's letter.
2. The program director will then notify the Student Success Hub of the decision. The Student Success Hub will inform the student of the decision.
3. If the appeal is denied, the student may appeal to the CHS Academic Standards and Grievances Committee within 10 business days of receiving the denial of the appeal. The CHS Academic Standards and Grievances Committee will review the dismissal and appeal materials and make a recommendation to the dean of the College of Health Solutions. The dean will have 20 calendar days to make a final decision.
4. If at any stage, a timely appeal is not submitted by the student, the program director will recommend dismissal to the Graduate College via the Student Success Hub. The Graduate College will then inform the student of the dismissal by letter.

Student code of conduct and academic integrity

ASU expects and requires its students to act with honesty, integrity, and respect. Required behavior standards are listed in the [ASU Student Code of Conduct and Student Disciplinary Procedures](#), the [ABOR Code of Conduct](#), the [Computer, Internet, and Electronic Communications Policy](#), the [ASU Student Academic Integrity Policy](#), and outlined by the [Office of Student Rights & Responsibilities](#). Violations of a Graduate College, College of Health Solutions, or Arizona State University policy will result in academic review and may consequently result in student disciplinary procedures.

Academic integrity

The [ASU Student Academic Integrity Policy](#) lists violations in detail. These violations fall into five broad areas that include, but are not limited to:

1. Cheating on an academic evaluation or assignment.
2. Plagiarizing.
3. Academic deceit, such as fabricating data or information.
4. Aiding academic integrity policy violations and inappropriately collaborating.
5. Falsifying academic records.

Information on the Academic Integrity procedure within the College of Health Solutions can be found at <https://catalog.asu.edu/policies/chs>.

Newly admitted graduate students will receive a "priority task" on their MyASU directing them to complete a canvas module on academic integrity. The module consists of a PowerPoint that outlines academic integrity and students must take a quiz and pass with an 80% or higher.

Student code of conduct

Violations of the ASU Student Code of Conduct, other than the provision concerning academic dishonesty, are more generally considered inappropriate behavior. The [Office of Student Rights and Responsibilities](#) reviews and sanctions these matters. If a student violates both the academic integrity provision and additional provisions of the Student Code of Conduct, both the college and the Office of Student Rights and Responsibilities will review the matter. Each independently makes determinations concerning violations and appropriate sanctions.

Professional conduct

ASU is a community and a professional work environment. Graduate students are expected to treat their peers, teachers, students, staff, and members of the ASU community with respect and work with them in a professional manner. Graduate students are representatives of their program, the College of Health Solutions, and ASU. Students must demonstrate the requisite qualifications for successful professional performance, including interpersonal skills, basic communication skills, appropriate professional conduct, and satisfactory performance in field experiences.

Graduate students who demonstrate behaviors or characteristics which make success in their related fields questionable will be reviewed by the program committee. The committee's review may result in a recommendation for dismissal from the program or implementation of probational conditions for continued participation. Students may appeal a recommendation for dismissal by following [established procedures](#).

College and university procedures and policies

All policies and procedures outlined in this handbook are in accordance with policy set by the [Graduate College](#) and [Office of the University Provost](#). In some cases, program policies may be more restrictive than those set by Graduate College and Provost.

Continuous enrollment policy

Students must be registered for a minimum of one credit hour during all phases of their graduate education, including the term in which they graduate. This includes periods when students are engaged in research, conducting a doctoral prospectus, working on or defending theses or dissertations, taking comprehensive examinations, taking Graduate Foreign Language Examinations, or in any other way using university resources, facilities or faculty time.

Registration for every fall semester and spring semester is required. Summer registration is required for students taking examinations, completing culminating experiences, conducting a doctoral prospectus, defending theses or dissertations, or graduating from the degree program. More information on this policy can be found [here](#).

Requesting a leave of absence

Graduate students planning to discontinue registration for a semester or more must submit a leave of absence request via their Interactive Plan of Study (iPOS). This request must be submitted and approved **before** the anticipated semester of non-registration. Students may request a maximum of two semesters of leave during their entire program. Students with a Graduate College-approved leave of absence are not required to pay tuition or fees, but in turn are not permitted to place any demands on university faculty or use any university resources. These resources include university libraries, laboratories, recreation facilities or faculty and staff time. More information on this policy can be found [here](#).

Registration policies

Students are strongly encouraged to enroll in courses well in advance of the start of the term. Enrollment must be complete by the Add/Drop deadline for the session in which the class is offered. Courses that are dropped by the Add/Drop deadline will not appear on a student's transcript. If a course is removed from a student's schedule after this deadline, it will be considered a withdrawal and a grade of "W" will be recorded. Term dates and deadlines, including the Add/Drop, Tuition Refund, Course Withdrawal, and Session Withdrawal deadlines, can be found on the [Academic Calendar](#).

Discrimination, harassment, and retaliation

Title IX of the Education Amendments of 1972 is a federal law which provides that no person be excluded on the basis of sex from participation in, be denied benefits of, or be subjected to discrimination under any education program or activity. Both Title IX and university policy [ACD 401](#) make clear that sexual violence and harassment based on sex is prohibited. An individual who believes they have been subjected to sexual violence or harassed on the basis of sex can seek support, including counseling and academic support, from the university. For information on resources, visit the sexual violence awareness, prevention, and response [website](#).

Student support resources

Academic program support

Students will be automatically enrolled in Canvas site dedicated to the Health Informatics, MAS program. This site houses resources such as a welcome video, current course offerings, applied project information, and faculty information.

The program director is available to meet individually with students regarding questions about the program, connecting with program faculty, and more. Their office hours are posted on the Canvas site each semester. Special hours are offered only to international students to accommodate time zones differences. To set up a meeting with the program director, students should email them directly.

The graduate support coordinator is available to assist students with concerns regarding iPOS, course registration concerns, college and university policy/procedure questions, and information regarding graduation. Students are encouraged to connect with the graduate support coordinator once per term or when making any adjustments to their iPOS.

Graduate students in the College Health Solutions have access to the [Graduate Student website](#), which houses college resources and advising information.

University resources

- [Graduate College](#)
- [Office of the University Provost](#)

Academic and career support

- [ASU Libraries](#)
- [Graduate Writing Center](#)
- [Career and Professional Development Services](#)
- [Graduate and Professional Student Association](#)
- [Student Clubs and Organizations](#)

Business and finance services

- [Financial Aid and Scholarship Services](#) (financial aid)
- [Student Business Services](#) (tuition, fees, and payments)
- [Parking and Transit Services](#) (permits, shuttles, public transit)
- [Sun Devil Card Services](#) (ID cards)
- [Enterprise Technology](#) (technology assistance)
- [Sun Devil Dining](#) (meal plans, M&G, hours)

Counseling services

ASU Counseling Services provides confidential, time-limited counseling and crisis services for students experiencing emotional concerns or other factors that affect their ability to achieve their goals. Support is available 24/7.

In-person counseling: Monday-Friday 8 a.m. – 5 p.m.

ASU Counseling Services, Student Services Building 234 Tempe, AZ 85287

480-965-6146

After-hours/weekends

Call EMPACT's 24-hour ASU-dedicated crisis hotline:

480-921-1006

For life threatening emergencies

Call 911

Disability accommodations

Reasonable accommodations are determined on a case-by-case, course-by-course basis to mitigate barriers experienced due to a disability ([SSM 701-02](#)). Students with disabilities who require accommodations must register with the [Student Accessibility and Inclusive Learning Services](#) and submit appropriate documentation. It is recommended students complete this process at the beginning of the term and communicate as appropriate with their instructor.

- Email: Student.Accessibility@asu.edu
- Phone: (480) 965-1234
- FAX: (480) 965-0441

Pregnancy: Students requesting services due to pregnancy ([SSM 701-10](#)) should be prepared to submit documentation regarding the pregnancy, any complications and clearance to return to school related activities. Student Accessibility can work with students to foster continued participation in a program, whether that be with academic accommodations such as absences or assistance requesting a leave, or through other requested accommodations.

Health and fitness

All ASU students enrolled in in-person programs have access to Sun Devil Fitness facilities on all campuses. For more information about facilities, membership and group fitness classes, please visit: <https://fitness.asu.edu>

For information about health insurance and appointments with care providers, please see the ASU Health Services website: <https://eoss.asu.edu/health>

International students

ASU's International Student and Scholars Center can provide support and answers to questions about visas, employment, scholarships and travel. To find more information or schedule an appointment with an ISSC adviser, visit the website: <https://issc.asu.edu/>

Veterans and military

The Pat Tillman Veterans Center provides guidance and support for students who are veterans, active-duty military or military dependents. For more information, please call the office at 602 496-0152 or visit: <https://veterans.asu.edu/>

Appendix

A: Program faculty

Marcela Aliste, PhD, MS, ACUE ([profile](#)) – molecular dynamics simulations, drug-receptor interactions, data privacy

Valentin Dinu, PhD ([profile](#)) – use of biological domain knowledge to supplement statistical analysis and data mining methods to identify genes and pathways associated with disease; exploration of database modeling approaches for managing large and heterogeneous data sets from clinical and biosciences domains

Bradley Doebbeling, MD ([profile](#)) – health care and systems redesign, population and health informatics, clinical workflow, information technology development and innovation

Marisa Domino, PhD ([profile](#)) – health economics and policy, behavioral health, Medicaid policy

Michael Donovan, PhD, JD ([profile](#)) – intellectual property, biotech/diagnostics, infectious diseases, regulation of diagnostics

Jack Gilbert, EdD ([profile](#)) – leadership, ethics, team-based care, ageism

Adela Grando, PhD ([profile](#)) – clinical decision support systems, information technology for patient empowerment in healthcare, building mobile technology to support patient decision processes

Chong Lee, PhD ([profile](#)) – cardiovascular disease and chronic disease epidemiology and health informatics, detection and prediction algorithms of chronic disease morbidity and mortality across various age and race groups

Jianming Liang, PhD ([profile](#)) – computer-aided diagnosis and prognosis of pulmonary embolism, personalized cardiovascular disease risk stratification, ensuring high-quality colonoscopy, personalized proton therapy for lung cancer

Li Liu, MD ([profile](#)) – advance precision medicine, incorporating evolutionary and functional information in model construction, translating bioinformatics discoveries into improvements in patient care

Anita Murko, MD, MACP, FAMIA ([profile](#)) – patient-centered medical home, health information exchange, clinical decision support

Chinedum Ojinnaka, PhD ([profile](#)) – identifying associations between individual and population-level social determinants of health, food insecurity, health and healthcare disparities, health outcomes, cancer-related disparities, health policy, applied research methods

Bradley Pristelski, MBA ([profile](#)) – leadership and innovation in health information technology, and health informatics

Matthew Scotch, PhD ([profile](#)) – genomic epidemiology of RNA viruses (influenza), phylodynamics, molecular epidemiology, bioinformatics, DNA sequence databases and metadata enrichment, natural language processing (NLP)

Davide Sottara, PhD ([profile](#)) – clinical informatics, knowledge representation, knowledge-driven model software systems, service-oriented event-driven software architectures, knowledge management and delivery, knowledge elicitation

Dongwen Wang, PhD ([profile](#)) – modeling and representation of biomedical knowledge in computer interpretable format, management of biomedical data in specific context of workflow and team collaboration, development and dissemination of online resources, and delivery of technology mediated behavioral interventions to facilitate knowledge translation, healthcare processes, and patient outcomes

B: Course descriptions

Required courses

BMI 593 Applied Project (3) Preparation of a supervised applied project that is a graduation requirement in some professional majors. Taken in the last term with BMI 614.

BMI 601 Fundamentals of Health Informatics (3 credits) Offers an overview of the field of health informatics. Combines perspectives from medicine and computer science for use of computers and information in health care and the health sciences. Includes an overview of health information literacy and data standards. Covers specific applications and general methodology in health informatics using current topics in the field.

BMI 603 Health Informatics Database Modeling and Applications (3 credits) Thorough coverage of the foundations of database systems and their specific use and modeling in healthcare and biomedical environments. Students learn through hands-on experience with the modeling and implementation of health-related databases using the relational approach. Topics include an overview of database models and architecture, database design, SQL, XML, and data warehousing as they are applied in clinical domains. Students are encouraged to explore database-related topics of their own, choosing ones that are relevant to a bioinformatics or clinical domain.

BMI 604 Health Information Communication (3 credits) This course provides the skills necessary to deliver complex health informatics information in different ways. Students learn about health informatics project development, including communication, legal aspects, and proposals. Students will be exposed to a variety of frameworks needed to communicate to different audiences, such as providers and stakeholders.

BMI 614 Current Perspectives in Health Informatics (3 credits) Seminar course using external speakers to discuss and review the current state of the health informatics field. Taken in the last term with BMI 593.

HCD 575 Leadership and Professionalism (3 credits) Integrates principles of leadership theory, innovation leadership, change leadership and systems thinking through didactic and experiential learning. Identifies characteristics of successful leaders in health and health care, develops competence and confidence in creativity and innovation, and identifies ways to implement meaningful change in the dynamic health care environment. Applies theories to case studies in health and health systems to promote critical analysis, discussion and reflection on topics that provide the framework for future coursework.

Elective courses

BMD 502 Foundations of Biomedical Informatics Methods I (3 credits) First semester of a two-semester course surveying the methods and theories underlying the field of biomedical informatics.

BMD 511 Health Economics, Policy, and Payment Models (3 credits) Economics provides a framework to understand and predict human decision making under scarcity, uncertainty and imperfect information. Examines concepts central to health care economics and their application to important decisions made by patients, families, practitioners, administrators and policy makers. Uses an individual family's scenario through a progressive case study to evaluate how incentives and information affect the health and health care of each family member. Each meeting integrates basic economic principles,

existing facts and knowledge from economic research, and individual perspectives and experience regarding how these concepts apply to health care policy.

BMD 562 Bioethical Issues in Applied Biomedicine (3 credits) Examines bioethical challenges in real-world health care settings, including emerging health advancements, technological innovations, an ever-changing social and cultural landscape, and increased attention to deeply challenging and personal decisions. Analyzes contextual history of bioethics and applies theory to modern-day ethical dilemmas.

BMI 515 Applied Biostatistics in Medicine and Informatics (3 credits) Comprehensive treatment of the statistical methods used most often to analyze quantitative data collected in medical and biomedical informatics studies, including clinical trials, epidemiologic studies, studies of the accuracy and performance of screening and diagnostic tests, and studies to develop predictive models. Students learn to use SAS statistical software to analyze biomedical data.

BMI 517 Advanced Biostatistics for Biomedical Research and Health Care (3 credits) This course will cover the use of computation as a tool for biostatistical data analysis, especially for research in the field of biomedical informatics. Major topics will include linear and non-linear regression, dimension reduction techniques and multiple comparisons. Time permitting, we will cover the basics of DNA and RNA sequencing and data analysis. Students will use the R statistical programming language to display and analyze data, and to evaluate statistical procedures and algorithms.

BMI 598 Topic: Knowledge Management and Engineering (3 credits) This course introduces the fundamentals of knowledge engineering, applied to biomedical informatics. The topics will include knowledge acquisition, representation, management, delivery, reasoning and revision, with an emphasis on current and best practices in healthcare.

BMI 598 Topic: Imaging in Diagnostics (3 credits) This course focuses on the basic principles of imaging informatics for diagnostics. Imaging informatics touches every aspect of the imaging chain from image generation, to image management, to image manipulation, and to image integration. Image generation covers the common imaging modalities (CT, MRI, PET, and ultrasound, etc.). Image management includes methods for storing, transmitting, displaying, retrieving, and organizing images, focusing on PACS (picture archiving and communication systems) and RIS (radiological information systems). Image manipulation uses pre-processing and post-processing methods to enhance, visualize, or analyze the images. Image integration combines images with other information needed for diagnosis, therapy, surgery, drug development, etc.

BMI 598 Topic: Telemedicine (3 credits) This course gives the bioinformatics student a thorough foundational knowledge of telemedicine. It explores telemedicine's basic definitions and concepts, discusses the reasons why it is gaining in use and popularity, delves into its most significant uses, and addresses the operational aspects of building telemedicine programs. The course offers an overview of the clinical, operational, legal, financial, clinical, and technology considerations associated with implementing a telemedicine program.

BMI 613 Workflow Analysis and Redesign in Health Systems Engineering (3 credits) Provides an overview of workflow analysis and process redesign and their use in quality improvement activities, including specification. Uses case examples to highlight key concepts and measurement concepts and covers techniques. Includes the links of systems engineering to fundamentals of decision theory, statistics and optimization. Includes discussion of current successful techniques for systems engineering. System engineering seeks to enable the successful design, implementation, deployment and

maintenance of successful systems. Emphasizes gathering and analysis of customer needs for the specification and documentation of required functionality early in the system's lifecycle.

BMI 615 Human Factors Engineering for Biomedical Applications (3 credits) Fundamental principles of human-computer interaction and human factors and how to apply them to real-world problems through class projects, homework, and real-world design. Focuses on learning why user-friendly interfaces can greatly improve work productivity and enhance the quality of healthcare without radically changing the underlying technology.

BMI 616 Clinical Decision Support and Evidence-Based Medicine (3 credits) Focuses on the major problems of human decision making in health care including causes of errors, decreased quality and increased costs. Explores the role of information technology, primarily through computer-based clinical decision support (CDS), to address these problems. Explores key methods used to provide CDS, the capabilities and limitations of current approaches, and the challenges for managing and updating the knowledge needed to deliver CDS in an enterprise setting. Origins of evidence-based decision making and policy formulation; how to use the tools and approaches that have been developed to support evidence-based decision making and policy formulation; and the history and evolution of systematic review and meta-analysis as a tool to inform decisions and policies based on evidence. Students gain hands-on experience by conducting a systematic review and a meta-analysis and using the results to draw conclusions and formulate health policy.