ASU® College of Health Solutions

Arizona State University

GRADUATE HANDBOOK

Master of Advanced Study (MAS) in Health Informatics

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Health Informatics Student Handbook

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 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.

Health Informatics

The Master of Advanced Studies (MAS) in Health Informatics is designed to offer professionals working in the field of health care an opportunity to earn a master level degree on the effective use of information technology, data science, and knowledge representation to impact health and health care. Professionals in non-health fields can also enhance their skills to transition to careers in this rapidly expanding field. Core courses provide a background in clinical informatics, while electives allow one to focus in the areas of clinical workflows and modern health technology, as well as skills with data analysis. The degree prepares graduates to enhance their skills for careers in a wide range of health care settings.

Clinical informaticians work to develop novel information technology, computer science and knowledge management methodologies for disease prevention, treatment, more efficient and safer patient care delivery and knowledge access. This field requires close collaboration among 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: 12 credits of Core Coursework, 15 credits of Electives, and 3 credits of Applied Project for the final culminating event.

Admissions

For a complete Health Informatics MAS application, students will be required to submit the following items:

- Official transcripts
- 2 Letters of Recommendation (Academic/Professional preferred)
- Personal Statement (1-2 pages)
- Resume/CV
- TOEFL/English Proficiency (for International Students) taken within 2 yrs

The Health Informatics program processes admission twice each year (Fall/Spring). Priority Application Deadlines are listed below:

➢ Fall Start: July 20th
➢ Spring Start: November 30th

[NOTE: The priority application deadlines are in place to ensure students will be processed in time for the application term. However, the Faculty Admissions

Committee will continue to review and accept MAS applications as they are completed prior to the start of the term.]

Application Review Process: The Faculty Admissions Committee will review an application when ASU Graduate Admissions has received all application materials and the student is in review status. This status can be monitored in MyASU, official admission decisions will be e-mailed to the student.

Once admitted to the Health Informatics graduate program, students have access to the BMI Graduate Student Blackboard site, where they will be able to find many of the materials in this handbook. Admitted students can access the site through their MyASU.

Funding Resources
Students should also visit the Graduate College web site and other links for student funding resources:

- ASU Financial Aid
- ASU Resources
- Federal Student Aid (Student Loans)
- Working at ASU

Student Responsibility
It is our expectation that all students enrolled in Health Informatics will observe the policies expressed in this handbook as well as the academic policies of Arizona State University. Above all, we expect each student to maintain a high level of academic integrity. Each student must act with honesty and integrity, and must respect the rights of others in carrying out all academic assignments. The policies that our program abides by include the student academic integrity policy, the student code of conduct and the misconduct in research policy of ASU. We require students to review and observe these policies described in the Board of Regents Policy Manual available online.

Other information concerning administrative procedures and university policies can be viewed online through the Student Services Manual (SSM).

We expect our students to be accountable for any and all of the policies defined above. Violations of a Graduate College, Health Informatics or Arizona State University policy will result in academic review and may consequently result in student disciplinary procedures.

Academic Integrity
Graduate students are expected to be ethical in their multiple roles as students, researchers, teachers or supervisors of undergraduate students, and representatives of the College and University. When in doubt about appropriate conduct, students should consult a faculty mentor to seek clarification. Breaches of academic integrity include, but are not limited to, the following:

- Engaging in any form of academic deceit, e.g., referring to materials, sources, or devices (camera phones, text messages, crib sheets, solution manuals, materials from previous classes, or commercial research services) not authorized by the instructor for use during an evaluation or assignment;
- Providing inappropriate aid to another student in connection with any evaluation or assignment;

- Engaging in plagiarism by using the ideas, words, or data of another person or persons without full and appropriate attribution;
- Engaging in plagiarism by claiming credit for the ideas, words, or data of another person or persons, or submitting work done by another as one's own;
- Failing to follow ethical procedures for research involving human subjects, such as violating participants' confidentiality, or failing to maintain confidential or sensitive research data in a secure location;
- Knowingly using data that do not meet appropriate standards for reliability and validity;
- Falsifying or misrepresenting hours or activities in relationship to an internship, externship, research assistantship, field experience, workshop, or service learning experience;
- Repeatedly failing to meet commitments and responsibilities, such as chronically missing deadlines, or failing to provide work promised to colleagues; and
- Behaving in a way that reflects poorly on the School, Institute, and University while conducting research or participating in community activities as a representative of the School.

The College of Health Solutions and Health Informatics has a zero-tolerance policy for any form of academic malfeasance. Penalties for unethical behavior range from being placed on academic probation to dismissal from the program. Additional information about academic integrity policies of the University is available on the Student Rights and Responsibilities [web site](). Graduate College information regarding academic integrity is available on the Academic Integrity [web site]().

Campus and Location
Arizona State University is "One university in many places" — with many campuses throughout metropolitan Phoenix (and ONLINE) that create a federation of unique colleges and schools. The College of Health Solutions is located in downtown Phoenix. The faculty and staff associated with Health Informatics are primarily located at the ASU Mayo Clinic Campus, additionally we also collaborate with ASU ONLINE.

- **ONLINE:** Classes are offered 100% ONLINE. Students will access course content through Blackboard. Students can access their courses in [MyASU]().
- **ASU and Mayo Clinic Campus:** Health Informatics is primarily located at the Mayo Clinic Scottsdale Campus, at the Johnson Research Building, 13212 E Shea Blvd, Scottsdale, Arizona 85259, (located on the 2nd floor). Health Informatics administration can be reached at phone number: 480-884-0220.
- **Downtown:** The College of Health Solutions is located at the ASU Downtown Phoenix campus, 500 North 3rd Street, Phoenix AZ 85004.

Tuition and Fees
For tuition expenses, students can view their student account on the *finances* tab in [MyASU]().

Students enrolled in the MAS in Health Informatics are applied a Health Informatics program fee, for up to date information regarding tuition and fees, please visit the [tuition and fee calculator]().

Health Informatics Faculty
Health Informatics faculty can be found [here]().

Policy Against Discrimination, Harassment, and Retaliation
Arizona State University is committed to providing an environment free of discrimination, harassment, or retaliation for the entire university community, including all students, faculty members, staff employees, and guests. ASU expressly prohibits discrimination, harassment, and retaliation by employees, students, contractors, or agents of the university based on any protected status: race, color, religion, sex, national origin, age, disability, veteran status, sexual orientation, gender identity, and genetic information. Additional information about this policy can be found here.

The Office of Student Rights and Responsibilities is responsible for reviewing and handling incidents involving students. The staff works closely with many other department and program staff on campus to ensure that all students can live, work, and learn in a mutually satisfying and secure environment. Students can get additional information about reporting an incident here.

Title IX
Title IX is a federal law that 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 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.

Additional University Resources – ASU Online
ASU Online Clubs
ASU Online Student FAQ
ASU Academic Integrity
Career and Professional Development Services
Bookstore
Counseling and Consultation
Disability Resource Center (DRC)
Graduate Admissions Office
Graduate College - Current Student Academic Resources
Graduate and Professional Student Association
Graduation Office (Registrar)
International Student Office
Library
MyApps
Online Support
Online Tutoring
Records (Academic)
Register For Your Classes
Residency
Scholarship Office
Student Accounts (Student Business Services)
Student Employment
Student Financial Assistance
Student Recreation Complex
Sun Card Office
Sun Devil Ticket Office
Testing Services, University
Top Tips on How to Succeed Online

Health Informatics Degree Requirements

Listed below are the ASU Graduate College and Health Informatics policies for obtaining a MAS degree in Health Informatics from ASU. Additionally, Graduate College requirements define the basic policies for obtaining a degree from ASU. Students can access the policy manual here: Graduate Policies and Procedures.

Advising

To ensure that academic programs run as smoothly as possible, students should consult with their Graduate Coordinator (see *title page* for name and contact information), if there are additional questions regarding the policies outlined in this handbook, or the ASU Graduate College requirements. Students can schedule an advising phone appointment, or meet in-person (if the student is local or in the area). Additionally, ASU Online has success support staff that help connect students with the ASU Online and online resources. Any academic questions or concerns regarding grades, plan of study, academic probation, graduation, etc. should be addressed through your Graduate Coordinator.

Once admitted to the Health Informatics graduate program, students have access to the BMI/Health Informatics Graduate Student Blackboard site, where they will be able to find many of the materials in this handbook. Admitted students can access the site through their MyASU.

Satisfactory Academic Progress

All graduate students are expected to make systematic progress toward completion of their degree. This progress includes satisfying the conditions listed below, and achieving the benchmarks and requirements set by the individual degree programs. Each degree program should have in place policies for satisfactory academic progress. Students are responsible for verifying additional satisfactory progress policies as required by their degree program. If a student fails to satisfy the requirements of their degree 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. The Dean of the Graduate College makes the final determination.

1. Graduate students must maintain a minimum 3.00 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). If either GPA falls below 3.00, the student must develop, with their advisor, an academic performance improvement plan that includes the conditions and timeframes for making satisfactory academic progress in their degree program.
    1. The iPOS GPA is calculated from all courses that appear on the student's approved iPOS.
    2. Cumulative ASU GPA represents all courses completed at ASU during the graduate career.
    3. The Overall Graduate GPA is calculated from all courses numbered 500 or higher that appear on the transcript, with the exception of courses counted toward an undergraduate degree at ASU (unless shared with a master's degree in an approved bachelor's/master's degree program); and courses identified as deficiencies in the original letter of admission. The student is considered to be on academic probation until the conditions specified in the academic performance improvement plan are met and both GPAs are above 3.00.

2. Satisfy all requirements of the graduate degree program.
3. Satisfy the maximum time limit for graduation from the student's graduate degree program (six years for master's, ten years for doctoral).
4. Doctoral students must comply with the five year time limit for graduation after passing the comprehensive examinations.
5. Successfully pass comprehensive exams, qualifying exams, foreign language exams, and the oral defense of the proposal/prospectus for the thesis or dissertation.
6. Successfully complete the culminating experience and, if required, the oral defense of the culminating experience.

Graduate students must stay continuously enrolled in their degree program. Failing to do so without a Graduate College approved *Request to Maintain Continuous Enrollment* is considered to be lack of academic progress and may lead to automatic dismissal of the student from the degree program. Persistent "W" and "I" grades during multiple semesters on a plan of study or transcript may reflect lack of academic progress.

Continuous Enrollment
Once admitted to a graduate degree program or graduate certificate program, 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 utilizing 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.

To maintain continuous enrollment the credit hour(s) must:
- Appear on the student's *Plan of Study,* OR
- Be research (592, 792), thesis (599), dissertation (799), or continuing registration (595, 695, 795), OR
- Be a graduate-level course.

Grades of "W" and/or "X" are not considered valid registration for continuous enrollment purposes. "W" grades are received when students officially withdraw from a course after the drop/add period. "X" grades are received for audit courses. Additionally, students completing work for a course in which they received a grade of "I" must maintain continuous enrollment as defined previously. Graduate students have one year to complete work for an incomplete grade; if the work is not complete and the grade changed within one year, the "I" grade becomes permanent. Additional information regarding incomplete grades can be found here.

Leave of Absence, Request to Maintain Continuous Enrollment
Graduate students planning to discontinue registration for a semester or more must submit a *Request to Maintain Continuous Enrollment form*. This request must be submitted and approved <u>before</u> the anticipated semester of non-registration. Students may request to maintain continuous enrollment without course registration for a maximum of two semesters during their entire program.

Having an approved *Request to Maintain Continuous Enrollment* by Graduate College will enable students to re-enter their program without re-applying to the university. Students who do not register for a fall or spring semester without an approved Request are considered withdrawn from the university under the assumption that they have decided to discontinue their program. Students removed for this reason may reapply for admission to resume their degree program; the application will be considered along with all other new applications to the degree program.

A student with a Graduate College approved *Request to Maintain Continuous Enrollment* is not required to pay tuition and/or fees, but in turn is not permitted to place any demands on university faculty or use any university resources. These resources include university libraries, laboratories, recreation facilities or faculty time.

Students will work with the Health Informatics Graduate Coordinator to submit these form to Graduate College, forms are provided [here](#) for MAS.

Pre-Admission Credits
Credit hours completed at ASU or from another regionally accredited US 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 degree program and the Graduate College office, students may include a maximum of 12 graduate-level credit hours with grades of "B" or better that were not used towards a previous degree. Preadmission credits must have been taken within three years of admission to the ASU degree 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.

Alternative Elective Courses
Elective courses other than those listed on the Health Informatics pre-approved elective list cannot be used on an iPOS unless pre-approved. The following procedure should be followed for students who wish to take outside electives:
  ➢ The student should prepare a written request to the Graduate Coordinator which includes: A course syllabus, the semester the students plans to take the course, how the course enhances the students plan of study
  ➢ The Graduate Coordinator will work with the Academic Programs Committee (APC) to consider the elective coursework, and notify the student if approved

Grading and Grade Policies

The University Registrar assigns a general grading policy for all students. The instructor of a course has full discretion in selecting which grades to use and report from the available grading options. Grades are assigned as follows:

Grade	Graduate Definition	Value
A+		4.33
A	Excellent	4.00
A−		3.67
B+		3.33
B	Good	3.00
B−		2.67
C+		2.33
C	Passing	2.00
D	No Graduate Credit	1.00*
E	Failure	0.00*

Grade	Graduate Definition	Value
W	Withdrawal**	--
I	Incomplete	--
X	Audit	--
Y	Satisfactory	--
Z	Course in progress***	--
XE	Academic Dishonesty	0.00*
NR	No Report	--
EN	Failing Never Participated	0.00*

Although the plus/minus scale includes a grade of A+ with a value of 4.33, the cumulative GPA is capped at 4.00. Questions about the grade scales may be referred to the University Registrar Services at registrar@asu.edu
*This grade cannot be applied to a graduate degree but is included in the calculation of a grade point average.
**This grade is given whenever a student officially withdraws from a class.
***This grade is usually given pending completion of courses such as research, thesis, dissertation or practicum. All grades of "Z" must be changed to "Y" before graduation.

A grade of "P" (pass) in a 400 or higher level course may not appear on a Plan of Study. Grades of "D" or "E" cannot be used to meet the requirements for a degree although they are used to compute the grade point averages. A student receiving a grade of "D" or "E" must repeat the course in a regularly scheduled (not an independent study) class if it is to be included in the Plan of Study. However, both the "D" or "E" and the new grade are used to compute the grade point averages. Grades on transfer work will not be used in computing grade point averages.

Incomplete Grades

Students will work with the instructor to complete the Incomplete Grade Form and submit to the Graduate Coordinator. Ultimately the timeframe for completion is determined by the instructor, in conjunction with the student. Once coursework has been fulfilled, the earned grade will be assigned. If the student does not complete coursework within one calendar year, the incomplete will become permanent and the student will have to re-take the course, if required to meet the degree requirements.

Time to Degree Limit

Master's students: All work toward a master's degree must be completed within six consecutive years.

Academic Integrity Required Module

All new Health Informatics students are required to complete the Academic Integrity Module, which is available for students on Blackboard (*ASU Academic Integrity Module Training*). Students must register for this course in Blackboard, review the presentation, and complete the Quiz by **September 1st** (for Fall starts) or **February 1st** (for Spring starts) with a passing score of 80% or higher. An additional reminder should be listed in MyASU under the priority task list. The Health Informatics Graduate Coordinator will be reviewing the course records to ensure all graduate students have completed the academic integrity modules successfully.

Plan of Study

The Interactive Plan of Study (iPOS) is a formal plan to meet degree requirements. The iPOS is an agreement that the work specified on the iPOS will be sufficient for the desired degree.

Students should strive to submit the iPOS online by the end of their first semester (MAS students) and are required to submit it when 50% of the minimum credit hours for the degree being pursued have been completed.

A Plan of Study (iPOS) must be filed online via MyASU with Graduate College. It includes all courses to be taken, and a Faculty Advisor/Chair. For steps on how to submit your Plan of Study, please visit this website.

> ➢ **Faculty Advisor/Chair:** In the iPOS system, students are required to submit a faculty advisor/chair. This person is automatically assigned for all Health Informatics students, please use the Academic Program Director, Dr. George Runger as the Advisor/Chair in the iPOS system.

> ➢ **Change of Coursework**: If a student needs to change the coursework listed on the Plan of Study, the student will need to update the courses listed in the iPOS system and re-submit the iPOS for review. This process is required if you projected a course you did not take, or if you need to change courses listed. The iPOS will be routed electronically to the Graduate Coordinator for review and approval, then subsequent routing for auditing by the Graduate College.

An approved Plan of Study must be on file before a student can register for their final culminating experience (BMI 593 Applied Project). Students should 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 Health Informatics plan of study course requirements.

Course and Graduation Requirements

The Health Informatics Plan of Study is provided below for both fall and spring starts. Core BMI courses are offered on a once-a-year basis. Thus, failure to complete a required graduate course during the appropriate semester of enrollment may delay graduation.

Additionally, course offerings may change for upcoming years, therefore the BMI program cannot guarantee the courses will be offered the same term/session. Students should review the ASU class schedule for the course schedule of course offerings.

Health Informatics Plan of Study (Sample – Fall Start)

Course	Term	Credits	Name	Type
BMI 601	Fall (A)	3	Fundamentals of Health Informatics	Core Course – Must Take 1st Semester
*	Fall (A)	3	Elective	*Elective Options Listed Below
BMI 603	Fall (B)	3	Health Informatics Database Modeling and Applications	Core Course
*	Fall (B)	3	Elective	*Elective Options Listed Below
BMI 616	Spring (A)	3	Clinical Decision Support and Evidence-Based Medicine	Core Course
*	Spring (A)	3	Elective	*Elective Options Listed Below
*	Spring (B)	3	Elective	*Elective Options Listed Below
*	Spring (B)	3	Elective	*Elective Options Listed Below
BMI 614	Summer (C)	3	Current Perspectives in Health Informatics	Core Course
BMI 593	Summer (C)	3	Applied Project	Culminating Experience
		30	Total Credits for MAS in Health Informatics	

*Electives: Please choose 5 of the elective courses below				
Course	Term	Credits	Name	Type
BMI 598	Fall (A)	3	Telemedicine Fundamentals	Elective
BMI 598	Fall (A)	3	Biostatistics with Computational Applications	Elective (Must Have Taken BMI 515)
BMI 608	Fall (B)	3	Project Management for Interdisciplinary Teams	Elective
BMI 613	Fall (B)	3	Workflow Analysis and Redesign in Health Systems Engineering	Elective
BMD 502	Fall (B)	3	Foundations of Biomedical Informatics Methods I	Elective
BMI 515	Spring (A)	3	Applied Biostatistics in Medicine and Informatics	Elective
BMI 615	Spring (B)	3	Human Factors Engineering for Biomedical Applications	Elective
BMI 598	Spring (B)	3	Knowledge Management and Engineering	Elective
BMI 598	Spring (B)	3	Population Health Management and Analytics	Elective (Must Have Taken BMI 515)

Health Informatics Plan of Study (Sample – Spring Start)

Course	Term	Credits	Name	Type
BMI 601	Spring (A)	3	Fundamentals of Health Informatics	Core Course – Must Take 1st Semester
BMI 616	Spring (A)	3	Clinical Decision Support and Evidence-Based Medicine	Core Course
*	Spring (B)	3	Elective	*Elective Options Listed Below
*	Fall (A)	3	Elective	*Elective Options Listed Below
*	Fall (A)	3	Elective	*Elective Options Listed Below
BMI 603	Fall (B)	3	Health Informatics Database Modeling and Applications	Core Course
*	Spring (A)	3	Elective	*Elective Options Listed Below
*	Spring (B)	3	Elective	*Elective Options Listed Below
BMI 614	Summer (C)	3	Current Perspectives in Health Informatics	Core Course
BMI 593	Summer (C)	3	Applied Project	Culminating Experience
		30	Total Credits for MAS in Health Informatics	

*Electives: Please choose 5 of the elective courses below				
Course	Term	Credits	Name	Type
BMI 598	Fall (A)	3	Telemedicine Fundamentals	Elective
BMI 598	Fall (A)	3	Biostatistics with Computational Applications	Elective (Must Have Taken BMI 515)
BMI 608	Fall (B)	3	Project Management for Interdisciplinary Teams	Elective
BMI 613	Fall (B)	3	Workflow Analysis and Redesign in Health Systems Engineering	Elective
BMD 502	Fall (B)	3	Foundations of Biomedical Informatics Methods I	Elective
BMI 515	Spring (A)	3	Applied Biostatistics in Medicine and Informatics	Elective
BMI 615	Spring (B)	3	Human Factors Engineering for Biomedical Applications	Elective
BMI 598	Spring (B)	3	Knowledge Management and Engineering	Elective
BMI 598	Spring (B)	3	Population Health Management and Analytics	Elective (Must Have Taken BMI 515)

Applied Project

To complete the MAS in Health Informatics, all students must complete a final culminating experience (BMI 593 Applied Project).

The Faculty Advisor/chair will serve as instructor for the BMI 593 Applied Project course. If you choose to complete your project external of BMI, you will choose the Applied Project Coordinator as your instructor upon registration of the course. The external project mentor will be the Site Preceptor. Prior to registration, you must complete an Interest Statement which lists your mentors and contains an abstract of your proposed project. This statement must be signed by your Advisor and returned to the Applied Project Coordinator.

A full Project Plan will be required at the beginning of the semester and should be agreed upon by your advisor. It will include project information such as title, research location, objectives, resources required, and a project timeline. Throughout the course of the Applied Project, you will be expected to submit progress reports and project updates 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.

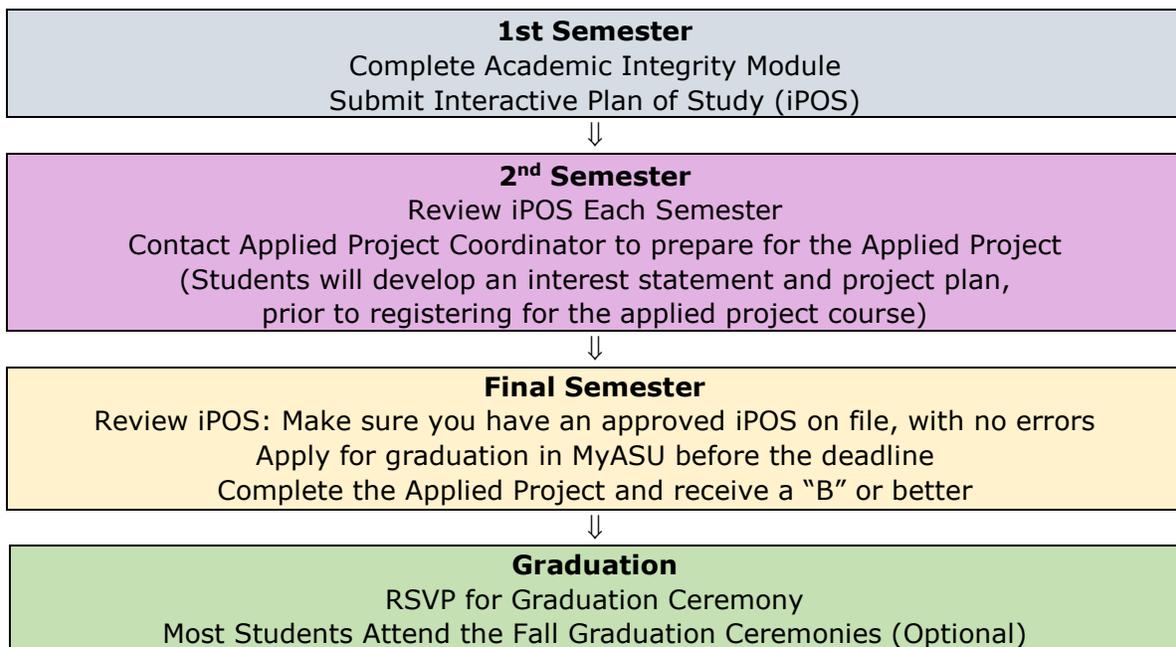The project itself can range from pure literature research (e.g. literature review; perspectives) to laboratory science (e.g. isolation of DNA for sequencing) to the clinical setting (e.g. surveys for clinicians or patients). The important part is that the project is in the field of biomedical informatics, which is very broad and interdisciplinary. You should start thinking about your interests and future project

ideas as you go through your classes to consider potential faculty advisors and project topics. Many students obtain an internship in a biomedical informatics organization and the work you do there may quality for a project as well. It is suggested that you contact the Applied Project Coordinator at least three months before the Applied Project semester so that you can have a successful and timely project start.

Final submission should be approximately 15-20 pages (actual text pages excluding cover page and references). A longer paper does not mean a better paper; it is often harder to be concise and to the point. The final paper should follow a journal article's sections (abstract, introduction/background, methods, results, discussion, conclusion, references, appendices, supplemental information) but depending on your specific project, may need to be altered. Submission of the project report written as a journal publication is also encouraged, but not required. Students in the Applied Project are highly encouraged to prepare a poster for a future poster session (e.g. AMIA, ASU student poster session) as well. Students must receive a B or better in the BMI 593 course to be eligible for graduation.

Advising Steps – MAS Health Informatics
In addition to the required coursework, the steps to achieve a MAS in Health Informatics are listed below. The program is designed to be completed in 1 year. For Spring admission, the program will take 1 ½ years to complete, at the earliest.

1st Semester
Complete Academic Integrity Module
Submit Interactive Plan of Study (iPOS)

⇓

2nd Semester
Review iPOS Each Semester
Contact Applied Project Coordinator to prepare for the Applied Project
(Students will develop an interest statement and project plan,
prior to registering for the applied project course)

⇓

Final Semester
Review iPOS: Make sure you have an approved iPOS on file, with no errors
Apply for graduation in MyASU before the deadline
Complete the Applied Project and receive a "B" or better

⇓

Graduation
RSVP for Graduation Ceremony
Most Students Attend the Fall Graduation Ceremonies (Optional)

Application for Graduation
Students should apply for graduation during the semester of planned graduation and no later than the date specified at the Graduate College website. Students can apply for graduation online through MyASU or in-person through the ASU Graduation Office, located in the Student Services Building.

Apply: All students must apply and be processed for graduation to receive their diploma. Students must check to make sure you have an approved iPOS on file and there are no course change requests needed. Any questions or concerns should be directed to the Graduate Coordinator.

Graduation Ceremony: Students that graduate in the Summer session have the option to participate and walk in the Fall ASU graduation ceremonies. There are no graduation ceremonies held during the Summer sessions. Information on Graduation Ceremonies can be found here.

- o **Convocation** is held for students graduating from the College of Health Solutions, details provided here.
- o **Graduate Commencement** is ASU-wide and is hosted by the Graduate College, details provided here.

Diploma: Information on the diploma can be found here. Diplomas are mailed approximately six to eight weeks after the degree conferral date. Students can review/manage their home address in MyASU.

Appendix I

MAS Course Descriptions

Core courses (12 credits):
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. Discusses evaluations of health systems.

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 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.

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.

Electives (15 credits):
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.

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 598 Biostatistics with Computational Applications (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 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 Population Health Management and Analysis (3 credits)
Offers a review of the Population Health landscape as well as many of the different types of Population Health programs, both in the private and public sectors. Special emphasis will be placed on: 1) Identifying unique populations for interventions, 2) Creating programs to target those populations, and 3) Developing a practical approach to analyzing the resulting financial and clinical outcomes.

BMI 598 Telemedicine Fundamentals (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 608 Project Management for Interdisciplinary Teams (3 credits)
Introduces students to the health care team and explores tools and techniques for establishing effective interdisciplinary teams in a health care setting, emphasizing collaborative clinical decision-making and patient management. By working in small teams, the course puts into practice these techniques, allowing students to collaborate with other health professionals to solve specific problems, provide services, or develop new understandings. Also covers the concepts, skills, tools, and techniques involved in the management of information system projects, providing an introduction to the established discipline of project management, with a specific focus on how they apply to managing information systems for a biomedical setting.

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.

Culminating Event (3 credits):
BMI 593 Applied Project (3)
Preparation of a supervised applied project that is a graduation requirement in some professional majors.