BIOMEDICAL INFORMATICS, MS

School of Interdisciplinary Informatics College of Information Science & Technology

Vision Statement
The vision of this program is to develop the next generation of biomedical specialists who are uniquely positioned to advance research and practice in contemporary information and knowledge management that impact biomedical, clinical and translational research, healthcare services, healthcare practice, public health care, and healthcare delivery in general. Graduates will be able to use their preparation to apply and investigate information and communication technologies to solve problems in the related biomedical fields in a comprehensive, competitive and effective way.

The program is designed as a research-oriented program with the goals of preparing graduate students to conduct advanced basic and applied research while capably serving as prospective employees in academic research as well as the IT healthcare industry. The program is geared towards motivated traditional students and technology specialists with the appropriate educational background that are ready to expand their knowledge of contemporary biomedical informatics issues and become biomedical informatics in academic, clinical, and organizational settings.

Program Contact Information
Kiran Bastola, PhD, Graduate Program Chair (GPC)
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dkbastola@unomaha.edu

Ms. Leslie Planos, Advisor
176C Peter Kiewit Institute (PKI)
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lplanos@unomaha.edu

Ms. Vanessa Hatfield-Reeker, Advisor
175C Peter Kiewit Institute (PKI)
402.554.3819
vhatfield@unomaha.edu

Program Website (http://www.unomaha.edu/college-of-information-science-and-technology/school-of-interdisciplinary-informatics/biomedical-informatics/ms-bmi.php)

Admissions
Application Deadlines
• Fall: July 1
• Spring: December 1
• Summer: April 1

Program-Specific Requirements
1. Submit a detailed resume indicating your work experience and background.
2. Submit a writing sample from work or previous academic experiences. Alternatively, if you do not have a writing sample, please submit a two-page, double-spaced, word-processed essay that addresses the following two topics:
   a. Discussion of two accomplishments that demonstrate your potential for success in the graduate program.
   b. Discussion of your unique personal qualities and life experiences that distinguish you from other applicants to our graduate program.
3. Submit three (3) letters of recommendation from references who are able to give an in-depth evaluation of your strengths and weaknesses with respect to academic work, and who are competent to judge your probability of success in graduate school.
4. The minimum undergraduate grade point average requirement for the MS in BMI program is 3.00 or equivalent score on a 4.00 scale. All applicants must have the equivalent of a four-year undergraduate degree.
5. GRE or GMAT entrance exams are required with the following minimum scores for those without a baccalaureate or equivalent degree from the United States:
   a. Verbal: 146
   b. Quantitative: 154
6. For unconditional admission, students must meet Graduate College admission standards, including a 3.0 GPA or higher in the last two years of undergraduate work. Students not meeting these standards may be considered for provisional admission. The MS degree does not require GRE test scores.
7. Applicants are required to have a command of oral and written English. Those who do not hold a baccalaureate or other advanced degree from the U.S., OR a baccalaureate or other advanced degree from a pre-determined country on the waiver list, must meet the minimum language proficiency score requirement in order to be considered for admission. Minimum scores are:
   a. Paper-based TOEFL: 550
   b. Internet-based TOEFL: 80
   c. IELTS: 6.5
   d. PTE: 53
8. Interview (optional): Although not required, applicants are strongly encouraged to arrange for an interview either one or more members of the Graduate Program Committee by directly contacting the committee chair. Telephone interviews are highly recommended for applicants outside the local area.

Admission Criteria
All applicants are considered on an individual basis. All applicants for the MS in BMI program must have earned a bachelor’s degree from a regionally-accredited, four-year institution of higher learning or the equivalent foreign institution and earned a GPA of 3.00 (on a 4.00 scale). Since many factors influence the success of a graduate student, an applicant’s maturity, motivation, employment history, writing samples, work experience and other accomplishments will also be considered in making admission decisions. In addition, for international applicants, TOEFL, IELTS, and PTE scores will be used along with other factors outlined above to make an admission recommendation.

Degree Requirements
Science Foundation Requirements
Foundation courses ensure that all students in the MS BMI program have a strong foundation on which to build the rest of the program. These courses not only provide essential prerequisite knowledge and skills for subsequent classes in the program, but they also contain a distinct body of knowledge that is an important part of the BMI professional’s education. All foundation courses are required for all students. However, students who have obtained an undergraduate BIOI degree will typically already have this foundation. In such cases, most, if not all, foundation courses are waived. Students with undergraduate degrees in other disciplines, including computer science, management information systems, or engineering, will usually require one or more foundation courses. Occasionally, a student’s work experience may be sufficient to waive one or more of the foundation courses.

b. Discussion of your unique personal qualities and life experiences that distinguish you from other applicants to our graduate program.

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Waivers for foundation courses are granted by the chair of the graduate program committee upon the recommendation of the faculty member who is responsible for an individual course. Students requesting a waiver for a particular course should be prepared to meet with a faculty member and answer questions in the area of the course. They should bring to the meeting any relevant transcripts, course syllabi, course material, or evidence of practical experience. Some foundation courses may have an option for testing out.

Applicants should have background in anatomy, physiology, cell biology or equivalent (any health science degree). Students with degrees in other disciplines will usually have to take foundation courses.

Foundation courses cannot be used to satisfy the 36 semester hours required for the MS in biomedical informatics degree. Students who have not completed all the foundation course requirements may be admitted on a provisional status until those requirements have been completed. All foundation courses must be completed prior to or concurrent with the first six (6) hours of MS in BMI graduate coursework.

### Information Technology Foundation Requirements

Foundation courses ensure that all students in the MS BMI program have a strong foundation on which to build the rest of the program. These courses not only provide essential prerequisite knowledge and skills for subsequent classes in the program, but they also contain a distinct body of knowledge that is an important part of the BMI professional’s education. All foundation courses are required for all students. However, students who have obtained an undergraduate BIOI degree will typically already have this foundation. In such a case, most, if not all, foundation courses are waived. Students with undergraduate degrees in other disciplines, including computer science, management information systems, or engineering, will usually require one or more foundation courses. Occasionally, a student’s work experience may be sufficient to waive one or more of the foundation courses.

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Applicants should have background in programming languages, data structures & algorithms, statistics, math or experimental methods (any engineering, computer science related degree). Students with degrees in other disciplines will usually have to take foundation courses.

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BMI 8896  GENETIC SEQUENCE ANALYSIS
BMI 8900  INDEPENDENT RESEARCH IN BIOMEDICAL INFORMATICS
BMI 8970  INDEPENDENT STUDY IN BIOINFORMATICS
CSCI 8340  DATABASE MANAGEMENT SYSTEMS II
CSCI 8876  DATABASE SEARCH AND PATTERN DISCOVERY IN BIOINFORMATICS
ISQA 8460  INTERNET OF THINGS (IOT), BIG DATA AND THE CLOUD
ISQA 8750  INTERACTIVE DATA VISUALIZATION

Total Credits 6

Health Informatics Track Electives

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<th>Code</th>
<th>Title</th>
<th>Credits</th>
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<tr>
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<tr>
<td>BMI 8080</td>
<td>SEMINAR IN BIOMEDICAL INFORMATICS</td>
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<td>BMI 8086</td>
<td>SPECIAL TOPICS: HEALTH INFORMATICS RESEARCH METHODS</td>
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<td>BMI 8900</td>
<td>INDEPENDENT RESEARCH IN BIOMEDICAL INFORMATICS</td>
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<td>BMI 8970</td>
<td>INDEPENDENT STUDY IN BIOINFORMATICS</td>
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<tr>
<td>ISQA 8196</td>
<td>PROCESS REENGINEERING WITH INFORMATION TECHNOLOGY</td>
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<td>ISQA 8736</td>
<td>DECISION SUPPORT SYSTEMS</td>
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<td>INFORMATION TECHNOLOGY PROJECT FUNDAMENTALS</td>
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<tr>
<td>PA 8740</td>
<td>HEALTH CARE POLICY</td>
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Total Credits 6

Exit Requirements

- **Thesis Option:** BMI 8990 6 Hours
  - All candidates should carefully review the Graduate College requirements for forming a Supervisory Committee, Thesis/Thesis Equivalent Proposal Approval Forms and final approval and submission of a thesis. This committee will be responsible for planning and supervising the student's thesis in coordination with the BMI GPC. A supervisory committee shall be formally established for each student upon completion of at least nine (9) hours of coursework or one year (which ever comes first) in the MS program. This committee will have responsible for planning and supervising the student's thesis in coordination with the campus-based BMI graduate program committee.