it's all about

Choices...

SHRP School of Health Related Professions

Masters and Ph.D. programs in

Biomedical Informatics

Certificate in Healthcare Informatics

Bioinformatics/Biotechnology Systems
BioMedical Imaging Systems
Clinical Decision Support Systems
e-Healthcare Systems
Hospital/Healthcare Management Systems

UMDNJ
University of Medicine & Dentistry of New jersey

Choices...

Students who choose UMDNJ's School of Health Related Professions want a University that is exclusively dedicated to health care, with state-of-the-art equipment, rigorous coursework, and faculty who care. All our resources go toward supporting a health care educational environment that attracts and nurtures the very best faculty and students.

DEPARTMENT OF HEALTH INFORMATICS

Introduction

Computing systems and technologies have become increasingly essential for modern practice of medicine, pharmaceutical and clinical research, efficient and effective management of health care, and health professions education. To address an increasing demand for well-trained researchers, educators, and managers in the expanding field biomedical informatics, and a growing critical need for informatics training, University of Medicine and Dentistry of New Jersey - School of Health Related Professions (UMDNJ-SHRP) offers a comprehensive curriculum leading to Ph.D. in Biomedical Informatics, M.S. in Biomedical Informatics, and a post-baccalaureate level Certificate in Health Care Informatics.

As a field of study, biomedical informatics incorporates the knowledge of the health sciences (medicine, dentistry, pharmacy, nursing and allied health sciences) with computer science, engineering, management information science, biostatistics and mathematics. Biomedical Informatics is an interdisciplinary science that involves both the conceptual and practical tools from these diverse disciplines for the understanding, invention, generation and propagation of biological and medical information - to solve complex problems in prevention and treatment of diseases, health care, health sciences and pharmaceutical research, education, clinical/medical decision-making, and delivery of health care. As such Biomedical Informatics is an essential element of 21st-century health and biological sciences.

The course work includes the theoretical foundations and the current range of applications of biomedical informatics within contemporary health sciences, and health care delivery systems. The curriculum contents focus on biomedical information in relation to structures, algorithms and design of efficient logic necessary to organize, store, retrieve and analyze data to produce new body of knowledge, techniques, and computational solutions. Such techniques, computational solutions, and discoveries in understanding biomedical information are vital for management of health care/hospital systems, clinical decision making, research in biomedical and pharmaceutical systems, and design and development of new drugs. Besides core courses, electives and directed research projects, students can pursue an in-depth study in one of the following areas of specialization:

- Bioinformatics/Biotechnology Systems
- BioMedical Imaging and Image Analysis
- Clinical Decision Support Systems
- e-Healthcare Systems
- Hospital/Healthcare Management Systems

Examples of biomedical informatics application include:

1. Reducing diagnostic uncertainties and improving clinical decision-making by using computing techniques and information technologies (e.g., develop clinical decision making tools for determining the probability that an ER patient with chest pain actually has acute cardiac ischemia or should be admitted to rule out myocardial infarction).
2. Designing interactive consultation system to treat patients more efficiently and cost effectively by using national databases referencing to a broad range of clinical experiences and pertinent variables.
3. Developing transportable software systems for image reconstruc tion and for 3-D visualization and analysis of medical image data.
4. Developing new medical applications for the methods of 3-D visualization and analysis for improved diagnosis, treatment, understanding and education of abnormalities in internal structures and in their function.

5. Designing large databases of digitized medical images for use in medical decision-making, teleradiology, or teleconsultation.
6. Improving research designs and outcomes of clinical trials, epidemiological studies and health services research.
7. Developing computing systems and solutions that will help design more effective and more informative clinical trials to cut years out of drug development process.
8. Utilizing computational approaches and modern computer-based techniques in drug design, molecular genetics and cellular genetics to solve complex clinical problems.
9. Designing and managing clinical, pharmacy, radiology, laboratory or hospital information systems.
10. Designing and implementing a system that will emancipate more time for healthcare providers to spend on more important aspects of patient care through delegation of some information handling and processing tasks to computers.
11. Designing a computer simulation suitable for analyzing medical and health care problems for constructing solutions to optimize decisions concerned with efficacy of information transfer, productivity & resource utilization in a health care facility.
12. Performing quality assurance activities, in-service, patient education software development, etc., in a health care facility at that facility's request.
13. Design and implement computer-based multimedia educational/ training systems (e.g., interactive CD-ROM, and Web-based educational programs) for intelligent tutoring, self-paced learn ing, staff development, or improving clinical decision- making on selected topics.

CERTIFICATE IN HEALTH CARE INFORMATICS PROGRAM

Students with baccalaureate degrees in health sciences who do not plan to seek the Master of Science degree may apply to enroll in the post-baccalaureate level Health Care Informatics Certificate Program. Curriculum contents and guided projects under this option can be tailored to meet students' specific area of interest or requirements. Upon successful completion of a total of 15 credits in the Program student is eligible to receive a Certificate in Health Care Informatics from UMDNJ. Permission to take courses is contingent upon fulfillment of the specific course prerequisites, and approval of the Program Director.

M.S. IN BIOMEDICAL INFORMATICS PROGRAM

The UMDNJ-SHRP Masters of Science degree program in Biomedical Informatics started in the Fall of 1993. The student body consists of a diverse group of health professionals, however, admission is not limited to medical and health related professionals.

All students complete at least 36 credits hours of which at least 30 hours must be formal course work. This includes:

1. 18 credit hours of core courses,
2. Six credit hours in an area of emphasis/ specialization,
3. Six credit hours of electives, and
4. Six credit hours of directed thesis or project.

In addition to core courses, electives and directed research projects, the student can pursue an in-depth study in one of the following tracks:

- Bioinformatics/Biotechnology Systems
- BioMedical Imaging and Image Analysis
- Clinical Decision Support Systems
- e-Healthcare Systems
- Hospital/Healthcare Management Systems

Students successfully completing the program will be granted the Master of Science degree in Biomedical Informatics.

A maximum of twenty (20) students are enrolled each semester. Full-time students may complete the Program in 18 months, but will usually require two years. Part-time students may take three to five years to complete the Program.

Program:

Degree Requirements for MS in Biomedical Informatics:

All students will complete at least 36 credits hours of which at least 30 hours must be formal course work with an average grade of 3.0 or better. This includes: 18 credit hours of core courses, six credit hours in an area of emphasis, six credit hours of electives, and six credit hours of directed thesis or project. All students must submit four copies of a completed thesis/project in required format.

Admissions:

Program Entrance Requirements for MS:

General Requirements: Applicant for admission to the Graduate Programs in Biomedical Informatics must hold a bachelors degree from an accredited institution in the US or its equivalent with a major in any field of health sciences (including medicine, dentistry, allied health, nursing, public health, pharmacy), or biological sciences, computer science, engineering or an equivalent field of study. A student seeking admission to any of the Graduate Programs must satisfy all entrance requirements of UMDNJ-SHRP.

These requirements include:

- Completed applications form with the SHRP's application fee.
- Three (3) letters of recommendation. Professors and/or individuals directly responsible for supervising the applicant, attesting to the candidate's potential success in the program, should write these letters.
- Official transcripts(s) of previous collegiate work or last earned degrees.
- GRE scores.
- Personal statement describing interest and commitment to the program.
- Evidence of basic proficiency in any programming language, database concepts and elementary calculus

GRE Exemption: Applicants already holding a doctoral (e.g., Ph.D., MD, DDS) degree in an appropriate discipline from an accredited institution in the USA, or UMDNJ's medical, or dental students are exempted from the GRE requirement. Students applying for admission to the Health Care Informatics Certificate Program are also exempted from the GRE requirement.

International Students and TOEFL: In addition to the requirements stated above international students are required to provide evidence of English language proficiency by submitting Test of English as a Foreign Language (TOEFL) examination scores. Applicants with scores below 550 or CBT equivalent are not considered for admission.

Prerequisite Course: Students are expected to have basic proficiency in any programming language, database concepts, elementary calculus and differential equations. Students lacking such proficiency are advised to take a bridge course at UMDNJ-SHRP namely, BINF4000: Essentials of Health Computer Science or its equivalent. This course provides an overview of all the essential and technical concepts of computing, data structure, and communications needed to understand the techniques, processes and applications outlined in the biomedical informatics curriculum. Students coming from non-health sciences (e.g., computer science or engineering) will be required to take an introductory physiology andor a Biochemistry course.

Advisement: Each entering student is assigned a faculty advisor who assists the student in initial course selection appropriate to the career goals of the student, selection of a project advisor and an advisory committee for the directed thesis or dissertation project.

Program retention: Retention in the graduate programs is based on the following criteria:

- maintenance of GPA at 3.0 or better;
- obtain no more than one course failure for the duration of the program;
- retake a failed course only once and attain a C or better grade; and

- adherence to the policies of the UMDNJ, the SHRP and affiliating institutions and health care agencies.

Career Opportunities: As the health care systems continue to become technology based, the demand for graduates of Biomedical Informatics (professionals who understand both the health care environment and computing systems and technologies) will only continue to grow at a significant rate. The curriculum provides in-depth training in biomedical informatics, computer science, health care management systems, and research methods. Students have opportunities to customize their plan of study, by selecting from a wider choice of courses and projects, for an in-depth study in their choice of specialization.

Graduates of this program will have knowledge, skills and credentials needed for a rapidly growing market. Program completion will provide for a wide range of career opportunities as managers, specialists, scientists, researchers and educators in various health care settings including: hospitals and health care facilities, laboratories, pharmaceutical companies, insurance and private and governmental agencies, and colleges of medical, dental, nursing and health professions in the nation - which must utilize modern information technologies. With the necessary academic preparations and informatics experiences, these careers can lead to positions as chief information officers (CIOs), scientists and directors of research, managers of hospital and laboratory information systems, and faculty members in various health sciences educational institutions.

PH.D. IN BIOMEDICAL INFORMATICS

The UMDNJ-SHRP Ph.D. degree program in Biomedical Informatics represents an articulated program of study designed primarily to serve health care practitioners, health sciences educators and researchers, and students who have completed an MS degree in: Biomedical Informatics, Computer Science, Engineering, Biology, Biomedical Sciences, or students who hold Master's or advance degrees in the health related professions, or basic sciences. The program is designed to prepare individuals for informatics leadership positions in the schools of health sciences, teaching hospitals, health care organizations, pharmaceuticals, biomedical research laboratories, and government agencies.

The curriculum consists of at least 61 credits beyond MS degree in Biomedical Informatics. Graduate courses taken for a MS degree, including biomedical informatics, computer science, computational biology and bioinformatics degrees may be applied to the Ph.D. course requirements. The 61 credits beyond the MS degree in Biomedical Informatics include: (a)technical/computing and management courses, (b) informatics specialization courses, and (c) 36 credits of original research work leading to a dissertation in selected area of specialization. A student that shows exceptional promise may enroll for the Ph.D. degree program without an M.S. degree by taking at least 85 credits.

Graduates of this program will develop, implement and evaluate informatics algorithms, biomedical computing solutions and technologies for decision support tools for improving clinical practice, and health care delivery and management; and design systems for more effective and informative research and education. Thus, expanding and advancing the science and methods of biomedical informatics. Students can select one of the following areas of specialization:

1. Bioinformatics/Biotechnology Systems
2. BioMedical Imaging and Image Analysis
3. Clinical Decision Support Systems
4. e-Healthcare Systems
5. Hospital/Healthcare Management Systems

Full-time students may complete the program in three to five years. Part-time students may take up to seven years to complete the program. Students successfully completing the program will be granted the Ph.D. degree in Biomedical Informatics jointly by UMDNJ.

Program

Degree Requirements for Ph.D. in Biomedical Informatics:

All students must complete at least 61 credits beyond the Master of Science degree; and maintain an average grade of 3.0 or better, with no more than two grades of C, and one credit hour of colloquium in biomedical informatics. In addition to meeting degree requirements, students are expected to assist in teaching at least one course in biomedical informatics, under the supervision of a faculty member.

Academic Requirements: The academic requirements for the Doctor of Philosophy in Biomedical Informatics are as follows:

1. At least 24 credits of advanced courses (above 5000 level) subject to advisor's approval and related to the expected research area of specialization; 12 credits must be at the 7000 level.

2. 36 credits of dissertation research culminating in a dissertation, which meets publication requirements of UMDNJ-SHRP. A minimum of 6 credits may be (at the 7000 level) taken as pre-doctoral research work, culminating in dissertation proposal. The proposal must be successfully defended. These credits may be applied to the dissertation credits.

3. Participation in the graduate colloquium/seminars, BINF7910 Biomedical Informatics Seminar each semester.

4. Submission of the final draft of the dissertation with successful dissertation defense.

5. In addition to the dissertation, submission of at least one research paper for publication in a peer reviewed journal.

6. Qualifying Examination: Students must pass a doctoral qualifying examination, which is designed to test the fundamental knowledge of students in the area of biomedical informatics theory and systems, health care systems, and selected Biomedical Informatics courses related to the area of specialization. Admission to the doctoral program does not imply candidacy for a degree. Registration for dissertation research will be permitted to those who have passed the qualifying examination.

7. Oral Examination: The dissertation must be defended in an oral examination.

Admissions:

Requirements for Program Entrance Requirements for Ph.D.:

Program Requirements: Applicant for admission to the Ph.D. Program in Biomedical Informatics must hold a Masters degree from an accredited institution in the US or its equivalent with a major in any field of health sciences (including medicine, dentistry, allied health, nursing, public health, pharmacy), or biological sciences, computer science, engineering or an equivalent field of study. A student seeking admission to any of the Graduate Programs must satisfy all entrance requirements of UMDNJ-SHRP.

These requirements include:

- Completed applications form with the SHRP's application fee.
- Three (3) letters of recommendation. Professors and/or individuals directly responsible for supervising the applicant, attesting to the candidate's potential success in the program, should write these letters.
- Official transcripts(s) of previous collegiate work or last earned degrees.
- GRE scores: (see below for GRE Exemption).
- Personal statement describing interest and commitment to the program.
- Evidence of basic proficiency in any programming language, database concepts and elementary calculus.

GRE Exemption: GRE Exemption: Applicants already holding a doctoral (e.g., Ph.D., MD, DDS) degree in an appropriate discipline from an accredited institution in the USA, or UMDNJ's medical, or dental students are exempted from the GRE requirement. Students already holding a M.S. in Biomedical Informatics degree from UMDNJ and students applying for admission to the Health Care Informatics Certificate Program are also exempted from the GRE requirement.

International Students and TOEFL: In addition to the requirements stated above international students are required to provide evidence of English language proficiency by submitting Test of English as a Foreign Language (TOEFL) examination scores. Applicants with scores below 550 or CBT equivalent are not considered for admission.

Prerequisite Courses: Students are expected to have basic proficiency in any programming language, database concepts, elementary calculus and differential equations. Students lacking such proficiency are advised to take a bridge course at UMDNJ-SHRP namely, BINF4000: Essentials of Health Computer Science or its equivalent. This course provides an overview of all the essential and technical concepts of computing, data structure, and communications needed to understand the techniques, processes and applications outlined in the biomedical informatics curriculum. Students coming from non-health sciences (e.g., computer science or engineering) will be required to take an introductory physiology course, or a course in Biochemistry.

Advisement: Each entering student is assigned a faculty advisor who assists the student in initial course selection appropriate to the career goals of the student, selection of a project advisor and an advisory committee for the directed thesis or dissertation project.

Program retention: Retention in the graduate programs is based on the following criteria:

- maintenance of GPA at 3.0 or better;
- obtain no more than one course failure for the duration of the program;

- retake a failed course only once and attain a C or better grade; and
- adherence to the policies of the UMDNJ, the SHRP and affiliating institutions and health care agencies.

Career Opportunities: As the health care systems continue to become technology based, the demand for graduates of Biomedical Informatics (professionals who understand both the health care environment and computing systems and technologies) will only continue to grow at a significant rate. The curriculum provides in-depth training in biomedical informatics, computer science, health care management systems, and research methods. Students have opportunities to customize their plan of study, by selecting from a wider choice of courses and projects, for an in-depth study in their choice of specialization.

Graduates of this program will have knowledge, skills and credentials needed for a rapidly growing market. Program completion will provide for a wide range of career opportunities as managers, specialists, scientists, researchers and educators in various health care settings including: hospitals and health care facilities, laboratories, pharmaceutical companies, insurance and private and governmental agencies, and colleges of medical, dental, nursing and health professions in the nation - which must utilize modern information technologies. With the necessary academic preparations and informatics experiences, these careers can lead to positions as chief information officers (CIOs), scientists and directors of research, managers of hospital and laboratory information systems, and faculty members in various health sciences educational institutions.

Applications for Admission: Students are admitted to both the fall and the spring semesters. Application packets including program related information may be obtained by writing or calling:

Office of Academic and Student Services
UMDNJ-School of Health Related Professions
65 Bergen Street
Newark, NJ 07107-3001
Tel: 973-972-5454
E-mail: shrpadm@umdnj.edu

Application for Fall admission must be received by June 1. Supporting documents must be filed by July 1. Application for Spring admission must be received by October 1. Supporting documents must be filed by November 1.

NON DEGREE STATUS

Students with baccalaureate degrees who do not plan to seek admission in the Master of Science, Ph.D. or Health Care Informatics Certificate programs may request permission to enroll as non-matriculated status students. These students can take up to 12 credits in the program. Permission to take courses is contingent upon fulfillment of the specific course prerequisites, availability of spaces, and approval of the Program Director. Non-matriculated status students may apply for matriculated status in the Program after demonstrating capability to obtaining the MS degree or the Certificate.

DEPARTMENT OF HEALTH INFORMATICS FACULTY AREAS OF EXPERTISE

1. BioMedical Knowledge representation, data modeling, and algorithm design. Application of computer programming techniques and database design for BioMedical and health care environments.

2. Research Methods in Biomedical Sciences, Biostatistics and Clinical Trials, Health Care Outcomes Measurement and Research, Health Services Research, and Advanced Research Methods in Biomedical Informatics.

3. Molecular Modeling and Drug Design: Molecular Dynamics Simulations of Biological Systems, Docking, Structure-Function Relationships Analysis of Biomacromolecules, Three Dimensional Quantitative Structure Activity Relationships Analysis, Protein Structure Predictions and Modeling.

4. Bioinformatics: Sequence Analysis, Comparative Genomics, Microarray Analysis, Gene Expression Profiling, Signal Transduction Networks Modeling.

5. Biomedical imaging and image analysis, Imaging technologies and medical diagnosis, medical imaging and networking, medical image processing and visualization, and advanced techniques for functional MRI applications.

6. Internet-based Health Systems, Telemedicine, and Design of Web-based (multimedia) Health care transaction systems.

7. Biomedical modeling & decision-making systems, and Biomedical instrumentation.

8. Health Information Systems Integration, hospital/health care management systems, Clinical information systems design, health care database management systems.

9. Public Health Informatics, and Geographical Information Systems.

10. Clinical problem solving & decision-making, Applications of AI and expert systems, Health care decision support systems, clinical decision analysis

DEPARTMENT OF HEALTH INFORMATICS

Requirements for Graduation for the Program of Ph.D. in Biomedical Informatics

Academic Requirements

For candidacy requiremnts, see faculty advisor.

1. Complete advance courses related to the area of specialization.
2. Pass the qualifying examination.
3. Submit and defend successfully dissertation proposal.

At least 12 credits must be at the 7000 level.

AISCODE	TITLE	CREDITS
CORE	**THREE REQUIRED CORE COURSES**	**9 CREDITS**
BINF7540	ADVANCED RESEARCH METHODS IN BIOMEDICAL INFORMATICS	
BINF7560	HEALTH INFORMATION SYSTEMS INTEGRATION	
BINF7600	SEMINAR ON REPRESENTATIONS AND ALGORITHMS IN BIOMEDICINE	
	Total CREDITS:	9
ELECTIVE	**SEE PROGRAM ADVISOR FOR ELECTIVES**	**6 CREDITS**
	Total CREDITS:	6

SEMESTER: SEE FACULTY
AREAS OF EMPHASIS/STUDENTS SELECT THREE OF THE FOLLOWING COURSES AS TRACKS: SEE PROGRAM ADVISOR FOR TRACK

Total CREDITS: 9

AT LEAST 6 CREDITS MUST BE AT 7000 LEVEL

TRACK I	**BIOINFORMATICS/BIOTECHNOLOGY SYSTEMS**	
BINF5220	PRINCIPLES & APPLICATIONS OF MOLECULAR MODELING & DRUG DESIGN	3

AISCODE	TITLE	CREDITS
BINF5230	PRINCIPLES AND APPLICATIONS OF BIO-INFORMATICS SEQUENCE ANALYSIS	3
BINF7580	HUMAN GENOME: MAPPING, SEQUENCING AND TECHNIQUES	3
BINF7590	GENETIC ENGINEERING, PROTEIN MODELING AND DRUG DESIGN	3
BINF7592	COMPUTER AIDED DRUG DESIGN AND QSAR/QSPR	3
TRACK II	**BIOMEDICAL IMAGING AND IMAGE ANALYSIS**	
BINF 5035	IMAGING TECHNOLOGIES AND MEDICAL DIAGNOSIS	3
BINF 5040	MEDICAL IMAGING AND NETWORKING	3
BINF7550	MEDICAL IMAGE PROCESSING AND VISUALIZATION	3
BINF7555	ADVANCED TOPICS IN MEDICAL IMAGING AND VISUALIZATION	3
TRACK III	**CLINICAL DECISION SUPPORT SYSTEMS**	
BINF5125	CLIN PROBLEM-SOLVING & DECISION MAKING	3
BINF5130	HEALTH CARE DECISION SUPPORT SYSTEM	3
BINF7510	CLINICAL DECISION MAKING AND DECISION ANALYSIS	3
BINF7530	HEALTH CARE DATABASE MANAGEMENT SYSTEMS	3
TRACK IV	**E-HEALTHCARE SYSTEMS**	
BINF5311	INTELLIGENT INSTRUCTIONAL SYSTEMS	3
BINF5312	INTERACTIVE LEARNING SYSTEMS FOR HEALTH SCIENCES	3
BINF7520	DESIGN OF INTELLIGENT SYSTEMS IN HEALTH SCIENCES	3
BINF7530	HEALTH CARE DATABASE MANAGEMENT SYSTEMS	3
TRACK V	**HOSPITAL/HEALTHCARE MANAGEMENT SYSTEMS**	
BINF5130	HEALTH CARE DECISION SUPPORT SYSTEM	3
BINF 5403	CLINICAL INFORMATION SYSTEMS DESIGN	3
BINF7530	HEALTH CARE DATABASE MANAGEMENT SYSTEMS	3

BINF7570	HEALTHCARE OUTCOMES MEASUREMENT AND RESEARCH	3
	Total CREDITS:	9
X		
BINF7910	RESEARCH & DEVELOPMENTS IN MEDICAL INFORMATICS: COLLOQUIUM	1
	Total CREDITS:	1
Y	REGISTRATION BY CREDIT	
BINF8000	PH.D. DISSERTATION	36
	Total CREDITS:	36
	Grand Total CREDITS:	61

DEPARTMENT OF HEALTH INFORMATICS

Requirements for Graduation for the Program of M.S. in Biomedical Informatics

AISCODE	TITLE	CREDITS
CORE COURSES		
BINF5005	HEALTH CARE INFORMATION SYSTEMS	3
BINF5020	BIOMED MODELING & DECISION MAKING SYSTEMS	3
BINF5030	VISUALIZATION IN BIOMEDICAL SCIENCES	3
BINF5100	INTRO TO BIOMEDICAL INFORMATICS	3
BINF5210	RESEARCH METHODS IN HEALTH SCIENCES	3
BINF5900	BIOMEDICAL DATA AND ALGORITHMS	3
	Total CREDITS:	18
ELECTIVE	SEE PROGRAM ADVISOR	6
	Total CREDITS:	6
SEMESTER: SEE FACULTY		
AREAS OF EMPHASIS/STUDENTS SELECTS ONE OF THE FIVE TRACKS		6
	Total CREDITS:	6
TRACK I	**BIOINFORMATICS/BIOTECHNOLOG SYSTEMS**	
BINF5220	PRINCIPLES & APPLICATIONS OF MOLECULAR MODELING & DRUG DESIGN	3

BINF5230	PRINCIPLES AND APPLICATIONS OF BIOINFORMATICS-SEQUENCE ANALYSIS	3

TRACK II BIOMEDICAL IMAGING AND IMAGE ANALYSIS

BINF 5035	IMAGING TECHNOLOGIES AND MEDICAL DIAGNOSIS	3
BINF 5040	MEDICAL IMAGING AND NETWORKING	3

TRACK III CLINICAL DECISION SUPPORT SYSTEMS

BINF5125	CLIN PROBLEM-SOLVING & DECISION MAKING	3
BINF5130	HEALTH CARE DECISION SUPPORT SYSTEM	3

TRACK IV E-HEALTH CARE SYSTEMS

BINF5311	INTELLIGENT INSTRUCTIONAL SYSTEMS	3
BINF5312	INTERACTIVE LEARNING SYSTEMS FOR HEALTH SCIENCES	3

TRACK V HOSPITAL/HEALTHCARE MANAGEMENT SYSTEMS

BINF5130	HEALTH CARE DECISION SUPPORT SYSTEM	3
BINF 5403	CLINICAL INFORMATION SYSTEMS DESIGN	3

THESIS DIRECTED PROJECT/ THESIS

BINF6000	DIRECTED RESEARCH/PROJECT	6

Total CREDITS:	6
Grand Total CREDITS:	36

DEPARTMENT OF HEALTH INFORMATICS

Requirements for Graduation for the Program of Health Care Informatics Certificate

AISCODE	TITLE	CREDITS
SEMESTER: CORE SEE FACULTY		
SELECT A MINIMUM OF 9 CREDITS FROM THE FOLLOWING:		
BINF4000	ESSENTIALS OF HEALTH COMPUTER SCIENCE	4
BINF5005	HEALTH CARE INFORMATION SYSTEMS	3
BINF5011	ESSENTIALS OF BIOINFORMATICS/BIO-TECHNOLOGY-DRUG DESIGN	3
BINF5030	VISUALIZATION IN BIOMEDICAL SCIENCES	3
BINF5131	HEALTH CARE FINANCE SYSTEMS	3
BINF5125	CLIN. PROBLEM-SOLVING & DECISION MAKING	3
BINF5312	INTERACTIVE LEARNING SYSTEMS FOR HEALTH SCIENCES	3
BINF5100	INTRO TO BIOMEDICAL INFORMATICS	3
	Total CREDITS:	9-10
SEMESTER: SEE FACULTY		
SELECT SIX CREDITS FROM THE FOLLOWING:		6
BINF 5006	PUBLIC HEALTH INFORMATICS	3
BINF5020	BIOMED MODELING & DECISION MAKING SYSTEMS	3
BINF5025	BIOMEDICAL INSTRUMENTATION	3
BINF 5035	IMAGING TECHNOLOGIES AND MEDICAL DIAGNOSIS	3
BINF 5040	MEDICAL IMAGING AND NETWORKING	3
BINF 5055	ADVANCED TECHNIQUES FOR FUNCTIONAL MRI APPLICATIONS	3
BINF5130	HEALTH CARE DECISION SUPPORT SYSTEM	3
BINF5135	CLINICAL SYSTEMS INTERFACE DESIGN	3
BINF5210	RESEARCH METHODS IN HEALTH SCIENCES	3
BINF5220	TOPICS IN BIOINFORMATICS	3
BINF 5230	PRINCIPLES AND APPLICATIONS OF BIOINFORMATICS-SEQUENCE ANALYSIS	3
BINF5311	INTELLIGENT INSTRUCTIONAL SYSTEMS	3
BINF5403	HEALTH CARE SYSTEMS DESIGN	3
BINF5413	BIOMEDICAL TEACHING SYSTEMS DESIGN:	3

	SEMINAR	
BINF5513	BIOINFORMATICS/ SYSTEMS DESIGN	3
BINF5900	BIOMEDICAL DATA AND ALGORITHMS	3
BINF6000	DIRECTED RESEARCH / PROJECT	6
BINF7510	CLINICAL DECISION MAKING AND DECISION ANALYSIS	3
BINF7520	DESIGN OF INTELLIGENT SYSTEMS IN HEALTH SCIENCES	3
BINF7530	HEALTH CARE DATABASE MANAGEMENT SYSTEMS	3
BINF7540	ADVANCED RESEARCH METHODS IN BIOMEDICAL INFORMATICS	3
BINF7550	MEDICAL IMAGE PROCESSING AND VISUALIZATION	3
BINF7555	ADVANCED TOPICS IN MEDICAL IMAGING AND VISUALIZATION	
BINF7560	HEALTH INFORMATION SYSTEMS INTEGRATION	3
BINF7570	HEALTH CARE OUTCOMES MEASUREMENT AND RESEARCH	
BINF7580	HUMAN GENOME: MAPPING, SEQUENCING, AND TECHNIQUES	3
BINF7590	GENETIC ENGG, PROTEIN MODELING & STRUCTURE BASED DRUG DESIGN	3
BINF7592	COMPUTER AIDED DRUG DESIGN AND QSAR/QSPR	3
BINF7600	SEMINAR ON REPRESENTATIONS AND ALGORITHMS IN BIOMEDICINE	3
BINF7700	SPECIAL TOPICS IN BIOMEDICAL INFORMATICS RESEARCH	3-6 CR

Total CREDITS: 6
Grand Total CREDITS: 15

DEPARTMENT OF HEALTH INFORMATICS

Requirements for Graduation for the Program of Biomedical Informatics Courses

AISCODE	TITLE	CREDITS
BINF4000	Essentials of Health Computer Science	4
BINF5005	Health Care Information Systems	3
BINF 5006	Public Health Informatics	3
BINF 5010	Bioinformatics Database Systems	3
BINF5011	Essentials of Bioinformatics/Biotechnology-Drug Design	3
BINF5020	Biomedical Modeling & Decision Making Systems	3
BINF5025	Biomedical Instrumentation	3
BINF5030	Introduction to Biomedical Imaging Systems	3
BINF 5035	Imaging Technologies and Medical Diagnosis	3
BINF 5040	Medical Imaging and Networking	3
BINF 5055	Advanced Techniques for Functional MRI Applications	3
BINF5100	Introduction to Biomedical Informatics	3
BINF5125	Clinical Problem Solving and Decision Making	3
BINF5130	Health Care Decision Support Systems	3
BINF5131	Health Care Finance Systems	3
BINF 5135	Clinical Systems Interface Design	3
BINF5210	Research Methods in Health Sciences	3
BINF 5220	Principles and Applications of Molecular Modeling and Drug Design	3
BINF 5230	Principles and Applications of Bioinformatics-Sequence Analysis	3
BINF5311	Intelligent Instructional Systems	3
BINF5312	Interactive Learning Systems for the Health Sciences	3
BINF 5403	Clinical Information Systems Design	3
BINF 5413	Health Sciences Teaching Systems Design	3
BINF5513	Bioinformatics/ Systems Design	3
BINF5900	Biomedical Data and Algorithms	3
BINF6000	Directed Research / Project	6
BINF7510	Clinical Decision Making and Decision Analysis	3
BINF7520	Design of Intelligent Systems in health sciences	3

BINF7530	Health Care Database Management Systems	3
BINF7540	Advanced Research Methods in Biomedical Informatics	3
BINF7550	Medical Image Processing and Visualization	3
BINF7555	Advanced Topics in Medical Imaging and Visualization	3
BINF7560	Health Information Systems Integration	3
BINF7570	Health Care Outcomes Measurement and Research	3
BINF7580	Human Genome: Mapping, Sequencing, and Techniques	3
BINF7590	Genetic Engineering, Protein Modeling & Structure Based Drug Design	3
BINF7592	Computer Aided Drug Design and QSAR/QSPR	3
BINF7600	Seminar on Representations and Algorithms in Biomedicine	3
BINF7700	Special Topics in BioMedical Informatics Research	3-6
BINF7910	Research and Developments in Medical Informatics: Colloquium	1
BINF 8000	Ph.D. Dissertation	36

APPLICATIONS FOR ADMISSION

Students are admitted to both the fall and the spring semesters. Application packets including program related information may be obtained by writing or calling:

Office of Enrollment Services
UMDNJ-School of Health Related Professions
65 Bergen Street
Newark, NJ 07107-3001
Tel: 973-972-5454
E-mail: shrpadm@umdnj.edu

Applications for Fall admission must be received by June 1. Supporting documents must be filed by July 1. Application for Spring admission must be received by October 1. Supporting documents must be filed by November 1. Non-degree status application form may be obtained by writing or calling:

SHRP - Center for Advanced Continuing Education
Scotch Plains Campus
1776 Raritan Road
Scotch Plains, NJ 07076 or contact
(908) 889-2560 telephone / (908) 889-2570 fax

For further information please contact:
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Associate Professors:
Haque, Laxminarayan, Mital, Montgomery, Michelson

Assistant Professors:
Gu, Shibata, Srinivasan, Sun