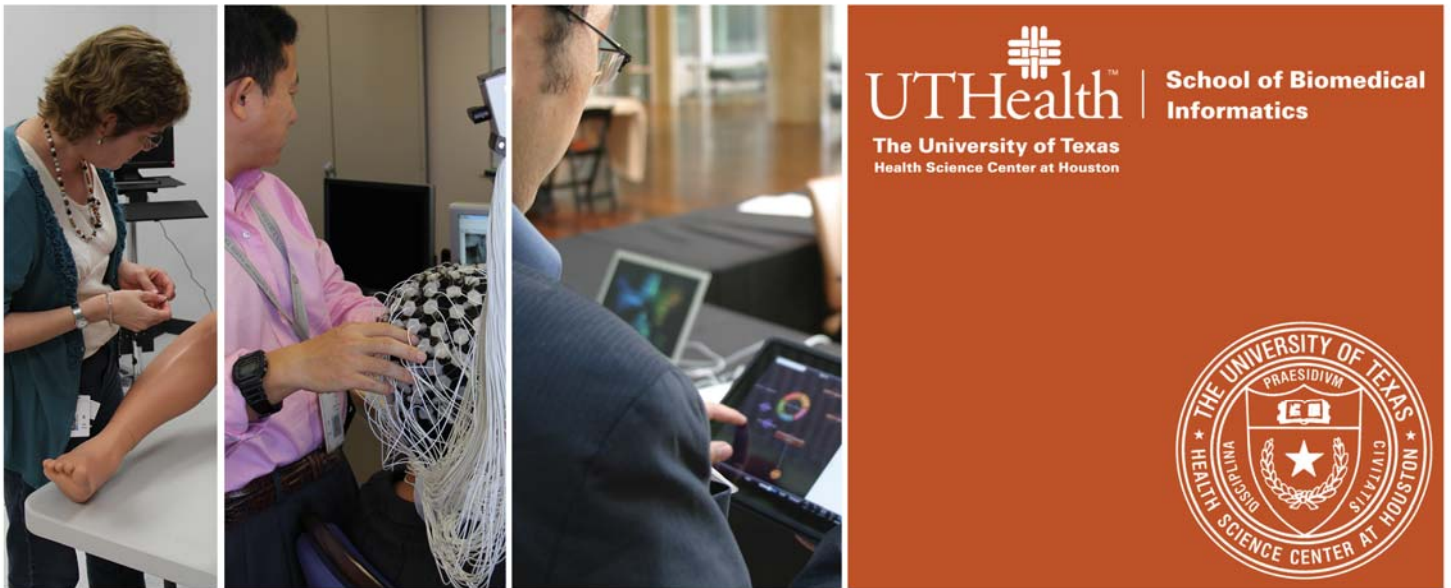# THE UNIVERSITY OF TEXAS
SCHOOL OF BIOMEDICAL INFORMATICS AT HOUSTON

2012-2014 CATALOG

The University of Texas Health Science Center at Houston is accredited by the Southern Association of Colleges and Schools Commission on Colleges to award certificate, baccalaureate, master's, doctorate and special professional degrees. Contact the Commission on Colleges at 1866 Southern Lane, Decatur, Georgia 30033-4097 or call 404-679-4500 for questions about the accreditation of The University of Texas Health Science Center at Houston.

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School of Biomedical Informatics Table of Contents

The School of Biomedical Informatics at Houston
2012-2014 Catalog

Message from the Dean

The School of Biomedical Informatics at Houston (SBMI), an academic component of The University of Texas Health Science Center at Houston (UTHealth) is the only academic program of biomedical informatics in the State of Texas and the only free-standing school of biomedical informatics in the nation. The mission of SBMI is to educate and train future scientists and professionals in biomedical informatics and health information technology, to conduct informatics research to improve healthcare and advance biomedical discovery, and to develop and use advanced informatics tools to solve practical problems in healthcare. The School's vision is to become a biomedical informatics innovator serving Texas, leading the nation, and impacting the world. The varied and talented faculty represent expertise both in the theory and practice of informatics applied to biomedical science and health care, and the pursuit of cutting edge research with a focus on translational informatics moving research from the lab to the bedside and to the community. Students find the School's performance-based, highly interdisciplinary, team-oriented education and research programs stimulating, challenging and career enhancing.

Both the Master's and Doctoral degree programs are offered in the unique environment of the Texas Medical Center, the most concentrated area of biomedical and healthcare expertise, knowledge and skills on the planet. There are outstanding opportunities for students to be involved in informatics applied to health care and biomedical research in the many UTHealth clinical and research components and the more than fifty other healthcare related entities in the surrounding Texas Medical Center. Students interact with highly qualified and experienced faculty active in research and developing solutions for a wide array of biomedical informatics problems. Through research consortia and centers, such as the National Center for Cognitive Informatics and Decision-Making in Healthcare, Gulf Coast Regional Extension Center for Health IT, Gulf Coast Consortia for Quantitative Biomedical Sciences, Center for Clinical and Translational Sciences, the Institute for Molecular Medicine for the Prevention of Human Diseases, and NASA/Johnson Space Center, students will interact with the best and brightest on the frontiers of human experience. As a Master's degree student, the student will learn to apply the most advanced understanding of healthcare and biomedical knowledge to improve biomedical discovery and the delivery of healthcare. Doctoral students will work with leading researchers in a broad array of biomedical informatics areas to advance the discipline and open up new areas such as translational informatics inquiry for future generations.

Students and faculty in our programs come from numerous health professions, basic sciences, biomedical sciences, social sciences, cognitive sciences, engineering, bioengineering, and computer science backgrounds. The "transdisciplinary" nature of the School's educational and research programs makes them unique and rewarding, and results in breakthrough discoveries. School faculty and students are involved in making groundbreaking contributions to healthcare, biomedical discovery and educational research. This includes inventing and evaluating new ways to capture, store, access, and evaluate healthcare and biomedical research knowledge and information. SBMI is exploring the relationships between brain function and structure, improving biosecurity, supporting public health, inventing new methods and tools for social interaction, understanding human-computer interaction, and changing space medicine. SBMI is also innovative in the use of educational research and technology, revolutionizing how to design and implement online educational and learning environments for both biomedical scientists and healthcare professionals.

If this is the kind of challenge and learning environment you are looking for, then join us and become part of the informatics leaders of tomorrow. Help us invent the future of health care and biomedical discovery.

Jiajie Zhang, PhD

Interim Dean

Academic Calendar
2012-2013

FALL SEMESTER   2012 Orientation — Entering Students: Registration August 1 – 25, 2012
      Classes Begin   August 27, 2012
      Classes End   December 7, 2012
      Final Examinations   December 10-13, 2012

SPRING SEMESTER 2013 Orientation — Entering Students: Registration December 17- January 4, 2013
      Classes Begin   January 14, 2013
      Spring Break   March 4-8, 2013
      Classes End   May 10, 2013
      Final Examinations   May 13-14, 2013

SUMMER SESSION 2013 (12-WEEK SESSION) Orientation — Entering Students: Registration April 22 – May 20, 2013
      Classes Begin   May 20, 2013
      Classes End   August 13, 2013
      Final Examinations   August 14-15, 2013

Academic Calendar
2013-2014

FALL SEMESTER 2013 Orientation — Entering Students: Registration August 1-25, 2013
      Classes Begin   August 26, 2013
      Classes End   December 13, 2013
      Final Examinations   December 16-17, 2013

SPRING SEMESTER 2014 Orientation — Entering Students: Registration December 17 – January 10, 2014
      Classes Begin   January 13, 2014
      Spring Break   March 3-7, 2014
      Classes End   May 9, 2014
      Final Examinations   May 12-13, 2014

SUMMER SESSION 2014 (12-WEEK SESSION) Orientation — Entering Students-Registration April 21 – May 16, 2014
      Classes Begin   May 19, 2014
      Classes End   August 14, 2014
      Final Examinations   August 15-18, 2014

Note: At the discretion of the Dean, the attendance of certain individuals may be required on a scheduled university holiday and on other than the usual scheduled class dates because of practicum/preceptorship requirements. Holidays will be announced in the class schedule each semester/session.

Administration

Jiajie Zhang, PhD
Professor and Interim Dean

Associate Dean for Management

Hongbin Wang, PhD
Professor and Associate Dean for Academic Affairs

Carolyn Elliott
Assistant Director of Admissions

Faculty

Noriaki Aoki, MD, PhD, MBA
Assistant Professor

Elmer V. Bernstam, MD, MSE, MS
Professor

Juliana J. Brixey, PhD, RN
Assistant Professor

Trevor Cohen, MD
Assistant Professor

Kim Dunn, MD, PhD
Assistant Professor

Amy Franklin, PhD
Assistant Professor

Lex Frieden, MA, LLD (hon.)
Professor

Yang Gong, PhD
Associate Professor

Chiehwen Ed Hsu, MPH, PhD
Associate Professor

Jonathan Ishee, JD, MPH
Assistant Professor

M. Sriram Iyengar, PhD
Associate Professor

Craig W. Johnson, PhD
Associate Professor

Allison McCoy, PhD
Assistant Professor

Doris L. Ross, PhD
Dean Emerita

Dean F. Sittig, PhD
Professor

Jack W. Smith, MD, PhD
Professor

Robert W. Vogler, DSN, MEd
Associate Professor

Hongbin Wang, PhD
Professor and Associate Dean for Academic Affairs

Jiajie Zhang, PhD
Professor and Interim Dean

Adjunct Faculty

Alemayehu Abebe, PhD
Assistant Professor

Allan Abedor, PhD
Professor Emeritus

Gabor Balazsi, PhD
Adjunct Assistant Professor

J. Robert Beck, MD
Adjunct Professor

Suresh Bhavnani, PhD
Adjunct Associate Professor

Eric Boerwinkle, PhD
Professor

Jeffrey Chang, PhD
Assistant Professor

Jung-Wei Chen, DDS., MS, PhD
Adjunct Assistant Professor

Wah Chiu, PhD
Adjunct Professor

Mary Edgerton, MD, PhD
Adjunct Associate Professor

Oliver Esch, MD
Adjunct Associate Professor

Adol Esquivel, MD, PhD
Adjunct Assistant Professor

Yuriy Fofanov, PhD
Adjunct Associate Professor

Jose Florez-Arango, MD, PhD
Adjunct Assistant Professor

John Frenzel, MD, MS
Adjunct Professor

Tsuguya Fukui, MD, MPH, PhD
Adjunct Professor

David Gorenstein, PhD
Professor

James Griffiths, MD
Assistant Professor

Robert Hunter, MD, PhD
Professor

John C. Joe, MD, MPH
Adjunct Assistant Professor

Constance M. Johnson, PhD
Adjunct Assistant Professor

Ioannis Kakadiaris, PhD
Adjunct Professor

Helen Li, MD
Adjunct Associate Professor

Yin Liu, PhD
Assistant Professor

Jianpeng Ma, PhD
Adjunct Assistant Professor

Rodger Marion, PhD
Adjunct Professor

Patrick McGinnis, MD, MS
Adjunct Assistant Professor

Sharon McLane, PhD, MBA, RN, BC
Adjunct Assistant Professor

Aleksander Milosavljeic, PhD
Adjunct Associate Professor

Parsa Mirhaji, MD, PhD
Adjunct Assistant Professor

Kevin Montgomery, PhD
Adjunct Associate Professor

Robert E. Murphy, MD
Adjunct Associate Professor

Koichi Nobutomo, MD, PhD
Adjunct Professor

Sachiko Ohta, MD, MS, PhD
Adjunct Associate Professor

Paula N. O'Neill, EdD
Adjunct Professor

Jagannatha Rao, MD, PhD
Adjunct Assistant Professor

John Riggs, MD, MS
Associate Professor

Doris L. Ross, PhD
Dean Emerita

Mano Selvan, PhD
Adjunct Assistant Professor

Michael Shabot, MD
Adjunct Professor

Ross Shegog, PhD
Assistant Professor

Hardeep Singh, BS, MD
Adjunct Assistant Professor

Anwar Sirajuddin, MS
Adjunct Instructor

Elizabeth Souther, RN, PhD
Adjunct Assistant Professor

Ignacio H. Valdes, MD, MS
Adjunct Assistant Professor

Muhammad Walji, PhD
Associate Professor

William Weems, PhD
Associate Professor

Olivier Wenker, MD
Adjunct Professor

Irmgard Willcockson, PhD
Adjunct Assistant Professor

Steven Wong, PhD
Adjunct Professor

Kevin C. Wooten, PhD
Adjunct Associate Professor

Shuxing Zhang, PhD
Adjunct Assistant Professor

Mission of the University of Texas School of Biomedical Informatics at Houston

The mission of the UT School of Biomedical Informatics at Houston is to improve healthcare and biomedical research by developing, refining and advancing the field of Biomedical Informatics through research, curriculum development, service, and by training professionals in areas of the discipline including bioinformatics, clinical informatics, computational biomedicine, and public health informatics. This mission is consistent with UTHealth's mission as a comprehensive health science university that educates health science professionals, discovers and translates advances in the biomedical and social sciences, and models best practices in clinical care and public health.

The University of Texas School of Biomedical Informatics at Houston

The University of Texas School of Biomedical Informatics at Houston (SBMI), formerly known as the School of Health Information Sciences (SHIS), was founded in 1973 as the School of Allied Health Sciences. The school is the newest of the six UTHealth schools. UTHealth is located in the world-renowned Texas Medical Center (TMC), one of the largest medical centers in the world.

In 1992, UTHealth determined it would focus on graduate education in the health sciences. At that time, the School began to shift from traditional allied health baccalaureate programs toward the development of graduate programs to join the other professional and graduate schools in the university. In 1998, the school created the Department of Health Informatics and began to offer a Master of Science in Health Informatics. In 2001, the name of the school was changed to the School of Health Information Sciences, which also subsumed all faculty and students in the department. The school offered a Master of Science in Health Informatics, a Doctor of Philosophy in Health Informatics and a Certificate Program in Health Informatics for non-degree seeking students. In 2010, the School underwent another name change– SHIS became the School of Biomedical Informatics. The school offers a Master of Science in Health Informatics, a Master of Science in Applied Health Informatics, a Doctor of Philosophy in Health Informatics, a Certificate Program in Health Informatics and multiple dual-degree programs.

The School will develop additional programs to meet future informatics needs.

The School is located in the University Center Tower, 7000 Fannin Street, Suite 600, Houston, Texas 77030 http://www.uthouston.edu/sbmi/

Application Information

Applications to the programs in the School of Biomedical Informatics may be obtained online at
http://registrar.uth.tmc.edu

Additional information is available by contacting the Office of the Registrar at:
The University of Texas Health Science Center at Houston (UTHealth)
Office of the Registrar
7000 Fannin, Suite 2250
Houston, TX 77030
Telephone: (713) 500-3388
Email address: registrar@uth.tmc.edu

Specific requirements for admission to the certificate and degree programs are provided in the program section of this catalog. Subject to approval of the Dean, each program's faculty is responsible for selecting applicants for admission. Admission of applicants is made without regard to, race, gender, national origin, religion, sex, sexual orientation, age, veteran status or disability.

An International Student is a student who is not a citizen or a permanent resident of the U.S. All international students must contact and must be cleared by the UTHealth Office of International Affairs prior to registration. An international applicant seeking admission to SBMI must submit the following:

- TOEFL (Test of English as a Foreign Language) score. Brochures and application material for the TOEFL may be obtained from the Office of the Registrar (applicants should use an institution code of 6906 or 6907). The scores for the TOEFL test must be submitted directly to the UTHealth Office of the Registrar from the TOEFL test centers. The minimum acceptable score is 550 on the paper test, and on the internet based test a score of writing 26, speaking 23, reading 21, listening 17 and a total score of 87. Upon recommendation of the Associate Dean for Academic Affairs and approval by the Dean, requirements for the TOEFL may be waived for applicants whose native language is English or if applicant has graduated from a high school or university in the United States. See http://www.toefl.org for test sites and testing information. Testing is at the applicant's expense.

- International applicants must submit official transcripts and a professional course-by-course evaluation of all transcripts from all universities outside the United States. The application forms (Educational Credential Evaluators, Inc., http://www.ece.org and World Education Services, www.wes.org) for such an evaluation may be obtained from the Office of the Registrar. The results of the evaluation must be submitted directly to the UTHealth Office of the Registrar by the agency. The applicant must pay for the evaluation report.

- The I-20 form, required by the Department of Homeland Security (DHS) and the United States Citizenship and Immigration Services (USCIS), is prepared by UTHealth and issued to qualified non-immigrant applicants who have been admitted and who have demonstrated financial ability to support their education. Upon acceptance, the non-immigrant student will be asked to provide financial and visa information so that the I-20 form may be completed. The student must submit the completed form to the American Embassy in his/her country of origin in order to receive a student visa or must otherwise be eligible for F-1 status in the U.S. Please contact the UTHealth Office of International Affairs for information.

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Official transcripts of all previous academic credit must be submitted to the Office of the Registrar. Courses with grades of "C" or lower are not transferable for admission or graduation credit.

Waiver or alteration of any course or credit-hour requirements, other than those mandated by statute, for admission to the School or of courses offered by the School, must be based upon a review of the circumstances, a justification and review by the faculty, and final written approval by the Dean. Requirements mandated by statute will not be waived or altered.

In order to register, a student must have on file in the Office of the Registrar official transcripts and documents of all previous academic work, and meet all admission requirements.

A student who knowingly falsifies or is a party to the falsification of any official University record (including transcripts and/or application for admission) will be subject to the offer of admission being withdrawn, or disciplinary action, which may include dismissal from the University.

Enrollment Status

A student is considered officially enrolled if tuition and fees are paid by the twentieth class day of the fall and spring semesters and by the fourth class day of a summer session. Students who matriculate in the School of Biomedical Informatics fall into one of the following categories.

- Program Student: a student admitted to an academic program who is following a set curriculum and pursuing a degree without an interruption of more than two semesters in enrollment.

- Full-time Student: a graduate student enrolled in at least nine semester credit hours (SCH) each during the fall and spring semester, or six semester credit hours in the 12-week summer session. Only those credit hours for UTHealth courses taken for credit are counted in the calculation of credits designating a full-time student.

  Part-time Student: a graduate student enrolled in a program for fewer than nine semester credit hours in the fall or spring semester, or fewer than six semester credit hours in the 12-week summer session.
- Certificate student: a student admitted to the certificate program seeking a certificate of completion of fifteen semester credit hours.

- Non-degree Student: a student who is admitted to the School for one or more courses but not admitted to a degree or certificate program. Enrollment as a non-degree student does not entitle a student to admission to a program. A non-degree student is not eligible to receive a degree and is allowed to register only with the permission of the course instructor. Non-degree students will not be allowed to register for practicum/doctoral courses. Non-degree students can complete a maximum of 12 semester credit hours and must maintain a 3.0/4.0 grade point average.

- Transfer Student: a student who has graduate level credits from another institution and who applies for admission to a degree program at the School. This student must be in good standing at the institution last attended.

- Concurrent/Inter-institutional Student: Concurrent and inter-institutional students can complete a maximum of 12 semester credit hours and must maintain a 3.0/4.0 grade point average.

- Any UTHealth student who is not admitted to a degree program or certificate program in the School of Biomedical Informatics can complete a maximum of 12 semester credit hours and must maintain a 3.0/4.0 grade point average. If a student takes more than 12 semester credit hours, only 12 semester credit hours can be counted toward any degree in the School of Biomedical Informatics.

Student Enrollment

Students enroll each semester by using myUTH on the web at https://eportal.uth.tmc.edu.   There is no on-site enrollment. Enrollment dates are announced in the online Schedule of Classes. http://registrar.uth.tmc.edu.

Certificate and General Admission Process

Certificate Admission Process

Completed applications are reviewed by the Director for Certificate Programs. Recommendations for or against admission are made to the Associate Dean for Academic Affairs. The Director for Certificate Programs advises all certificate students.

General Admission Process for Degree Programs

The School admissions committee reviews completed applications to the research-focused master's and doctoral programs. Applicants to the Applied Master's Program are reviewed by the program coordinator and faculty of the Applied Master's Program who make admissions recommendations to the Associate Dean for Academic Affairs.

The admission criteria include, but are not limited to:

- Prior academic preparation (depth, breadth, and performance): application, college transcripts, and letters of recommendation;
- Relevant work experience (particularly practice in the field of study): application, goal statement, curriculum vitae (CV) or resume, and letters of recommendation;
- Career goals: application, goal statement, and letters of recommendation;
- Motivation: goal statement, letters of recommendation, and college transcripts;
- Integrity: goal statement, and letters of recommendation;
- Standardized tests: scores on GRE or MAT and TOEFL (if required);
- Thesis, publications and other scholarly works: supplemental documents provided by applicant;
- Success in overcoming social, economic or educational disadvantages.

Qualified applicants will be invited to interview with faculty members at the discretion of the committee. The Office of Academic Affairs will schedule personal interviews. In addition to the listed criteria, the applicant's communication skills and understanding of the program may be evaluated based on the personal interview. Admissions decisions will be made after all interviews are completed. Completed applications with all supporting documentation must be received July 1 for fall admission, March 15 for summer admissions, and November 1 for spring admissions to the certificate and master's program and December 1 for fall admissions to the doctoral program.

Certificate of Health Informatics Application Deadlines

Fall admissions   July 1
Spring admissions   November 1
Summer admissions   March 15

Master of Science in Health Informatics and Master of Science in Applied Health Informatics Application Deadlines

Fall admissions   July 1
Spring admissions   November 1
Summer admissions   March 15

Doctor of Philosophy in Health Informatics Application Deadlines

Fall admissions   December 1

Address application inquiries and personal interview inquiries to:

Office of Academic Affairs
UTHealth School of Biomedical Informatics at Houston
7000 Fannin, Suite 800
Houston, TX 77030
(713) 500-3591
SBMIAcademics@uth.tmc.edu

Financial Information

Optional and Mandatory Fees

Certain mandatory and optional fees should be anticipated at the School. Mandatory fees are required of all students. Optional fees are not required, but the student may elect to subscribe to any of the services listed under optional fees. All fees are subject to change without notice.

Mandatory Fees

Application fee:

Any prospective student submitting an application to the school for consideration must also submit a non-refundable $60 application fee. This fee is assessed to cover the cost of processing the application.

Tuition

Beginning Fall 2011, Texas resident tuition is $206 per semester credit hour. Non-resident tuition is $656 per semester credit hour.

A resident doctoral student who has a total of 100 or more semester credit hours of doctoral work at an institution of higher education is required to pay nonresident doctoral tuition rates. For more information contact the Office of the Registrar.

Fees and Charges

- Application Fee (non-refundable) $60
- Audit Fee per Course $25
- Graduation Fee (see below) $75
- Installment Use Fee $20
- Late Installment Use Fee $15
- Late Registration Fee $25
- Returned Check Fee $25
- Credit Card Service Use Fee **(NEW FEE)**   1.25% (Fall 2012); 2.5% (Fall 2013)
- Transcript Fee per Request $5
- Student Liability Insurance Fee (fall semester) $14.50
- Student Liability Insurance Fee (spring semester) $9
- Student Health Insurance Fee (annual rate) $1,204
- Student ID Replacement Fee $10/card
- Laboratory Fee (see below) $10-30
- Student Services Fee (see below)

- Information Technology Access Fee $33/semester

- Computer Resource Fee $100/semester

- Technology Fee **(NEW FEE** – see below**)** $100/semester

- Alternative Instruction Delivery Fee for Web Courses

       delivered within Texas $100/semester credit hour
       delivered outside of Texas $750/semester credit hour

Graduation Fee

A graduation fee of $75, payable at registration for the student's final academic term, is required of all students. This fee covers expenses associated with graduation but does not cover rental of the cap and gown. This fee is charged whether or not the student participates in graduation.

Laboratory Fees

Laboratory fees are assessed in an amount to cover the cost of laboratory materials and supplies used by the student. These fees range from the minimum of $10 per laboratory course to a maximum of $30 per laboratory course. Each didactic course has a lab fee of $10. The practicum and preceptorship courses have a lab fee of $30.

Student Services Fee

The Student Services Fee is a mandatory fee assessed per semester credit hour to all students. The annual fee is $499.65 with a maximum charge of $193.30 per fall and spring semester and $113.05 for the summer semester. The fee provides funding towards student governance activities, Student Health Services, Student Counseling, shuttle service, and recreational facilities. Optional family coverage for most student services is available. The schedule of fees is as follows:

FULL-TIME STUDENT RATES (REQUIRED) 499.65 ANNUALLY				
Service	**Fall/Spring**	**Summer**	**9-Month**	**12-Month**
Recreation	$77.65	$51.70	$155.30	$207.00
Health	$73.25	$33.20	$146.50	$179.79
Shuttle	$25.00	$16.60	$50.00	$66.60
Counseling	$11.75	$7.85	$23.50	$31.35
Government	$5.65	$3.70	$11.30	$15.00
TOTAL	**$193.30**	**$113.05**	**$386.60**	**$499.65**

Technology Fee

Effective Fall 2012 a new Technology Fee will be assessed to all students at $100 per semester to cover the expenses associated with the software, hardware, programming, maintenance fees and technical support used by students. The fee will support SBMI's goal in achieving to be the best publically supported biomedical informatics school in the US by conducting the highest quality programs in education, biomedical informatics applications and research. The fee will also allow SBMI in using the most current technology to train students and help attract the best and brightest students for their quality graduate programs.

Optional Fees

- Transcript Fee: A transcript of academic credits received at this University may be obtained upon written request to the Office of the Registrar, and submission of $5 for each transcript requested.
- Audit Fee: For a fee of $25 per course, a student may elect to audit a course, i.e., attend the course without receiving academic credit. SBMI does not allow auditing of classes.
- Transportation Expenses: Students are required to provide their own transportation to clinical sites.
- Academic Regalia Rental: The charge for rental of the cap and gown is approximately $100. Information on ordering academic regalia is sent to students several months before annual commencement exercises.

Professional Liability Insurance

Every student enrolled in the School of Biomedical Informatics must have professional liability insurance coverage in force throughout each semester enrolled in the minimum policy amount of $100,000 per claim. The professional liability insurance must include coverage for breach of confidentiality of protected health information in electronic or other patient records. Advance written notice or posting may change the minimum amount required by the Office of the Dean. The premium for this insurance is due at the time of initial registration and each fall semester. The annual premium is prorated based on the student's date of entry. The annual premium is approximately $14.50 per year.

Competitive Academic Scholarship Awards

Competitive Academic Scholarship awards are designed to facilitate the scholastic development of students who are in high academic standing. The benefits of this award are two-fold; (1) a direct financial award, and (2) if the recipient is not a resident of Texas, the change in status to resident tuition for that academic school year (September through August). All SBMI degree-seeking students are eligible to compete for these scholarships. The number of Competitive Academic Scholarships awarded each year is dependent on the availability of funds.

The criteria for selection are:
- Grade point average documented by the Director of Admissions

- Pattern of academic achievement

- Recommendation of the Student Advising Committee

- Success in overcoming socioeconomic or educational disadvantages

The SBMI Student Scholarships Committee considers all submissions. The SBMI Student Scholarships Committee is composed of UTHealth faculty and student representation. The recommendations of the SBMI Student Scholarships Committee are submitted through the Associate Dean for Academic Affairs for submission to the Dean. Notification of awards will be made by mail.

Applications for the limited scholarships in the School are available in the Office of the Dean, University Center Tower, Suite 600, located at 7000 Fannin.

Summary of Estimated Annual Fees and Expenses Based on Full-time enrollment

Program Expenses

Application Fee (one-time only)	$60
Immunization (approximate cost, one time only)	$175
Student Criminal Background Check	$44
Tuition (based on 24 hours annually)[1]	
Resident	$4,994
Non-Resident	$15,744
Student Service Fee	$499.65
Information Technology Fee	$99
Computer Resource Fee	$300
Technology Fee	$300
Liability Insurance	$14.50
Laboratory Fees	$80-$90
Graduation Fee	$75
Transportation (Student's responsibility)[2] varies	
Books, Supplies, Miscellaneous Program Expenses (see Program section) varies	
Personal Anticipated Expenses (approximations)	
Apartment Rent[3]	
One Bedroom (UT Housing)	$648
Daycare varies	
Health/Medical Insurance[4]	
Basic coverage for student only	$1,204
Basic for student and spouse	$4,710
Basic for child(ren)	$1,894

[1] based on 9 semester hours fall and spring and 6 semester credit hours for summer; $206 is resident cost per semester credit hour/$656 is non-resident cost per semester credit hour.

[2] the student is responsible for personal transportation and parking fees to and from the clinical practicum sites

[3] does not include utilities or food costs

[4] Student Health Insurance -- Current information available from UTHealth Auxiliary Enterprises. All students are required to show proof of coverage or proof of purchase of health insurance. International students also must provide proof of repatriation coverage or the student can purchase repatriation insurance for a cost of $75/per year.

Note: All of the estimates above are subject to change without prior notification.

Estimated Program Expenses for Health Informatics Master's programs per year

The expenses, which are specific to Health Informatics, are estimated at:

Item	Estimated Expenses
Textbooks*, computer** (required), software	$3300
Lab Fees	$10 per course
	$30 per practicum/preceptor course***

* Textbooks – SBMI students are not under any obligation to purchase a textbook from a university-affiliated bookstore. The same textbook may also be available from an independent retailer, including an online retailer.
** Computer ($2,500 first year only) requirements based on the annual recommendation of the Office of Academic Computing.
*** Practicum/Preceptor site may require additional requirements, e.g., immunizations, insurance.

In addition, students must pay required school expenses (tuition, fee, etc.). See the Expense Table summarizing estimated expenses.

Academic Standards, Policies, and Procedures

In order for students to maintain good standing and receive appropriate grades and credits for their work, they must adhere to the School's academic policies, procedures and standards.

The School requires a high level of academic achievement from its students, and the School has defined criteria for a student in good standing, a student worthy of academic recognition, and a student in academic jeopardy. A letter grading system is used to assess the student's level of achievement.

Grading System

"A" indicates excellent; "B" indicates good; "C" indicates unsatisfactory; "NC" indicates "no credit" and does not affect the GPA calculation or status of the visiting graduate student and "F" indicates failing; "P" indicates passing; "WP" or "WF" indicates that the student has withdrawn passing or failing, respectively; "I" indicates an incomplete grade, meaning that course requirements have not been satisfied. All letter grades are reported without modification of plus (+) or minus (-). Grades recorded for courses dropped after the deadline for WP or WF will be recorded as "F."

Grade point averages (GPA) are computed at the end of each semester using the following academic standard:

A =	4 points
B =	3 points
C =	2 points
NC =	not counted
P =	not counted
F =	0 points
WF =	0 points
WP =	0 points

Graduate level courses in which a grade of "B" or better has been earned may not be repeated for credit. Graduate level courses in which a grade of "NC" is given do not count toward degree plan requirements. Courses taken at the School in which a grade of "F" or "WF" has been earned may be repeated for credit within the School with the permission of the Dean and as course sequencing allows. Courses taken at the School in which an "F" has been earned may not be taken at another institution for credit or to raise the grade point average (GPA).

If a course in which a student earns an "F" is repeated, the student must earn a grade of "A" or "B" in that course; any grade below a grade of "B" will result in automatic dismissal.

No graduate student may earn more than two grades of "C", "WF", or "F" including grades in courses taken as concurrent enrollment even though the courses are remediated; the result will be automatic dismissal. All enrollments in courses, including repeated courses, will be reflected on the student's transcript.

An incomplete or "I" grade may be given when course requirements have not been satisfied. A student must remove a grade of "I" within one academic semester or summer session following receipt of such a grade, or the incomplete grade will be converted to the grade of "F." Grades of "I" will not be used in calculating the grade point average. All "I" grades must be removed from a student's record (course requirements satisfied) before the student is eligible for graduation.

A pass/fail grading system is used in some courses. The courses that are graded on a pass/fail basis are described in the course description section of the catalog. In these instances, a symbol of "P" is used to designate "pass" and an

"F" to designate "fail." Hours for courses taken pass/fail that are passed are not entered in the grade point calculation; however, hours for courses taken pass/fail and failed are included in the grade point calculation.

Each program establishes the maximum number of semester credits allowed for a student may take on a Pass/Fail basis during his or her study in that program. Not all courses are available on a pass/ fail basis.

Grade point average is calculated using grades and credit hours for courses except for those courses in which a grade of "I," "WP" or "P" is recorded. Also, courses in which an "F" was earned are not included in the grade point average if these courses have been repeated and passing grades obtained. The grade achieved in the repeated course is included in the calculation. Those courses taken through concurrent enrollment are not used in calculating the grade point average. Courses obtained by Petition for Equivalency Credit (PEC) and by transfer from other institutions are not used in the calculation of the grade point average.

Student in Good Standing

To be considered in "good standing" and making "satisfactory academic progress" in the School, a graduate student admitted to a graduate degree program must be following the degree plan; must maintain a cumulative grade point average of 3.0 or above; and must not be on academic probation or suspension as determined by the Associate Dean for Academic Affairs. To remain in good standing a graduate student may earn no more than one "C" grade during their program.

Academic Probation

Probation is an official warning status for a defined period of time that informs the student of unsatisfactory academic and/or professional performance, and provides the student an opportunity to improve. Any student who does not adhere to the academic and professional standards of the School is subject to probation, suspension, and/or dismissal by the Associate Dean for Academic Affairs. Academic probation will be noted on a student's transcript. When a student attains a minimum cumulative grade point average of 3.0, the student's official transcripts will reflect the student's removal from academic probation.

Criteria upon which grades are based are given at the beginning of each course in the course syllabus. Professional standards include appropriate dress, attendance, conduct, and any particular standards required by the program. If a student has questions regarding academic and professional requirements or if assistance is needed in meeting the standards, the student should consult with the course instructor or advisor.

Following the completion of the semester in which any of the following occur, the Associate Dean for Academic Affairs will place a graduate student on academic probation if the student (1) receives a second grade of less than "B" in a graduate course while at SBMI; (2) earns a calculated cumulative grade point average (GPA) less than 3.0; (3) receives a grade of less than "B" ("C," "WF," or "F") in a required course; or (4) fails to make satisfactory progress toward the degree. The graduate student is removed from academic probation at the end of the following registration period when no grade below "B" is assigned in a graduate course, a cumulative grade point average of 3.0 is achieved, and any other cause for probation is removed or remedied.

An SBMI graduate student will be dismissed if a third grade of "C," "WF," or "F" is earned in any graduate level courses. If a grade of "C" is earned while the student is enrolled in a concurrent or Inter-institutional course, the student will be placed on probation. If it is the third grade of "C," the student will be dismissed.

A graduate-level course is a course that has HI or HIT as prefix letters and an initial number not less than 5 in the catalog number or is any graduate level at another institution.

Student Conduct and Discipline

All students are responsible for knowledge of and compliance with UTHealth policies regarding student conduct. Students are referred to the UTHealth Handbook of Operating Procedures (HOOP) Policy 186. http://www.uthouston.edu/hoop/policy.htm?id=1448220.

Grade Grievance Procedure

In attempting to resolve any student grievance regarding grades or evaluations, it is the obligation of the student first to make a serious effort to resolve the matter with the faculty member with whom the grievance originated. Individual faculty members retain primary responsibility for assigning grades and evaluations. The faculty member's judgment is final unless compelling evidence suggests differential treatment or mistake. If the evidence warrants appeal, the student must submit a request in writing within 30 days of the date of the evaluation in question and, in the case of a grade for a course, within 30 days of the date the Registrar recorded the grade of the course in question. The request for the appeal with supporting evidence must be submitted to the Associate Dean for Academic Affairs, and the appeal must be resolved by no later than the end of the semester after the semester in which the grade was earned. Upon receipt of the request, the Associate Dean for Academic Affairs will review the case and submit a copy of the appeal to the appropriate Standing Committee of the Faculty Governance Organization for review and recommendation. The Associate Dean for Academic Affairs will submit a written recommendation to the Dean. The determination of the Dean is final.

Academic Dismissal and Appeal

If a student who is on academic probation for one semester does not achieve the minimum cumulative 3.0 GPA and the individual course grades necessary to be removed from probation or remove the cause of probationary status, that student will be notified of dismissal from the program by the Associate Dean for Academic Affairs and will not be allowed to continue in the program.

The student may request a reconsideration of the dismissal by submitting a written request to the Dean within five working days of receipt of the dismissal letter. The student must also send a copy to the Chair of the Admissions, Progression and Graduation Committee of the Faculty Governance Organization. The student must provide evidence in support of the request for reconsideration of the dismissal. The Admissions, Progression and Graduation Committee will review the request and render its recommendation in writing to the Dean. The student will be notified in writing of the Dean's decision within seven calendar days of the Committee's recommendation. The determination of the Dean is final.

Reapplication Following Dismissal

Should a student reapply and be readmitted to the program from which he or she was dismissed, the student will be placed on scholastic probation for one semester. If the student fails to raise his or her cumulative GPA within that semester to 3.0, or if the student makes a course grade below that required to be removed from probation, or otherwise fails to meet standards to be off probation, the student will be dismissed from the School and may not be readmitted.

Grade Reports

Students may access their term grade reports online at myUTH at https://eportal.uth.tmc.edu.

Change of Name, Address or Marital Status

The student's full legal name is the name recorded on the application at the time of admission. The student must report any changes in name, address or marital status to the Office of the Registrar, and to the SBMI Office of Academic Affairs. Official documents verifying a name change are required.

The student's full legal name is used on the permanent academic record, certificates, and diplomas.

Transfer Credit

Transfer credit for equivalent courses taken elsewhere may be awarded and used to meet degree requirements if their equivalency to a SBMI degree program course is approved through a Petition for Equivalency Credit (PEC). The maximum number of transferable semester credit hours is 3 for the certificate program, 12 for the master's program, and 36 for the doctoral program. Some School degree programs require a certain number of credits for support courses, which are courses (possibly taken elsewhere) that enhance a student's degree plan as determined by their advising committee. Credit for support courses taken elsewhere is approved by the student's advising committee—a Petition for Equivalency Credit is not required. Contact the Office of Academic Affairs for information.

Applicants who are presenting course work from universities or colleges outside the United States to meet admission or graduation requirements are referred to the section on International Applicants in this catalog for a listing of additional requirements.

Reentry after Non-Attendance

A student who has not enrolled in two consecutive registration periods (including the summer session) must submit to the Office of Academic Affairs a "Reentry Form" signed by the student's advisor or the Program Coordinator of Certificate Programs indicating approval for reentry to the program. A former student who has not completed a Reentry Form and has not enrolled for two consecutive registration periods must reapply for admission to the program and the School.

Deferment for Newly Admitted Students

A newly admitted program student is allowed up to one year for deferment. The Office of Academic Affairs must be notified of all deferments before the start of the semester. Any student who does not enroll for two consecutive registration periods shall no longer be considered a program student and must reapply for admission to the program and the School.

Withdrawal from the University

A student who withdraws from the School at the end of, or prior to, completing a scheduled semester, should notify his or her advisor and the Associate Dean for Academic Affairs in writing. The letter should include the date of intended withdrawal and the specific reason(s) for withdrawal. The student should state if it is his or her intention to seek readmission to the course of study at a later date and, if so, the specific date he or she would wish to be readmitted. The letter should include a permanent mailing address to which any communications may be sent.

Clearance for Withdrawal, Graduation, or Dismissal

Any student who withdraws or is dismissed from, or completes a program in the School must complete the official student clearance process. Such clearance is necessary to ensure that the student has met all obligations to

specified offices in the School, UTHealth, and the Texas Medical Center. A student clearance form and instructions for completing the clearance process may be obtained from the Office of Academic Affairs.

Explanation of Course Numbers

Courses are numbered by a letter prefix, which designates the program and/or division in which the course is taught, followed by a four-digit number. In all program courses, the first digit indicates the year beyond high school; the second digit is the number of semester credits given for the course, except for courses with variable credit in which the second digit is a zero; and the last two digits indicate the number the program uses to identify the course. An example of a course number is HI 5301. In this case the "HI" stands for Health Informatics; the "5" stands for fifth year; the "3" stands for three semester credits given for the course; and the "01" is the program identification number for the course. The pre-foundations courses do not conform to this standard.

> The program/division prefixes used are:
> **HI** Health Informatics
> **HIT** Health Informatics Technology

Registering /Adding a Course

To register for a course, the student must first obtain approval from the student's advising committee and the course instructor (if required). The student must then contact the Office of Academic Affairs to get the call number and an approval code. Following this, the student must use myUTH at https://eportal.uth.tmc.edu to add the course to their schedule. Refer to the Office of the Registrar's School of Biomedical Informatics Academic Calendar for deadline dates for adding a course for any semester or session. A student will be unable to add a course after the official reporting date.

Dropping or Withdrawing from a Course

To drop a course before the official reporting date the student must go to myUTH at https://eportal.uth.tmc.edu. The student must have the call number to drop the class.

After the official reporting date and before the last date to withdraw listed in the Office of the Registrar's School of Biomedical Informatics Academic Calendar for that semester, the student must obtain a withdrawal slip from the Office of the Registrar or the Office of Academic Affairs. Students must obtain signatures of the course instructor(s), and the Associate Dean for Academic Affairs in order to drop the course(s). The student must return the completed form to the Office of the Registrar before the deadline for dropping a course. The grade recorded on the transcript will be a "WP" (withdrawal passing) or "WF" (withdrawal failing). The instructor must assign a grade of "WP" or "WF". A "WP" is indicated on the transcript if a student has no grades recorded or has a passing grade in the course at the time the course is dropped. The "WP" will not be calculated as part of the GPA. A "WF" is recorded if the student has a failing grade at the time the course is dropped. A record of "WF" on the transcript will be calculated as an "F" in determining the GPA.

If a student does not officially withdraw from the course, a grade of "F" will be assigned. A grade of "F" is recorded if course is dropped after the deadline stated in the academic calendar for that semester or session.

Auditing a Course

SBMI does not allow auditing.

Petitioning for Course Equivalency

A student who wishes to receive credit for a course which he or she has taken at another institution and which is similar in content to any course offered at the School is to submit required documentation for a Petition for Equivalency Credit (PEC) to the Office of Academic Affairs. Courses for which grades of less than "B" were achieved will not be accepted for equivalency. For specific details see the Student Handbook on the school web site http://www.uthouston.edu/sbmi/current-students/student-handbook/.

Concurrent/Inter-institutional Enrollment

SBMI students may take courses for credit at area state colleges and universities through concurrent enrollment. Courses taken by concurrent enrollment will not be counted toward full-time status of a student and will not be calculated into the student's GPA. Universities available for concurrent enrollment include Texas Woman's University (Texas Medical Center), University of Houston (main campus), and University of Texas Medical Branch at Galveston. Concurrently enrolled students may complete a maximum of 12 semester credit hours and must maintain a 3.0/4.0 grade point average in those courses.

Enrollment in courses offered by private universities is made through inter-institutional enrollment. Courses taken through inter-institutional enrollment will be counted toward a student's full-time status and will be calculated into the student's grade point average. Rice University and Baylor College of Medicine are available for inter-institutional enrollment. Inter-institutional students may complete a maximum of 12 semester credit hours and must maintain a 3.0/4.0 grade point average in those courses. Information about participating institutions and procedures for concurrent/ inter-institutional enrollment may be obtained from the Office of Registrar at http://registrar.uth.tmc.edu/Registration/ConcurEnrollment.html .

General Degree Requirements

In order to receive a degree or a certificate from the School of Biomedical Informatics, the student is required to fulfill certain academic, in residence, and degree candidacy requirements. A student must be a Program Student and must have completed all the curricular requirements of that program before being eligible for a degree or certificate.

In Residence Requirement

The term "in residence" refers to the minimum number of semester credit hours that must be earned in the School. A student must fulfill his or her in residence requirement in order to receive any academic degree or a certificate from the School. Refer to each degree section for specific semester credit hour minimum requirements.

Student Organizations

Student Governance Organization

The SBMI Student Governance Organization is made up of SBMI students. Both master and doctoral students are represented in the Student Government Organization. Any degree program student enrolled in the School is eligible to become the elected representative of his or her program.

The purpose of the Student Governance Organization is:
1. to provide students of the School an organized feedback and advisory mechanism to the administration and faculty;
2. to provide students a mechanism by which they may have an impact on the decision-making process;
3. to provide social, cultural and recreational activities for students of the School; and
4. to provide representation to the UTHealth Student InterCouncil (SIC).

Student Membership in Professional Organizations

Professional organizations promote interest in the profession with specific aims toward service and fellowship for the social, intellectual, and professional benefits of each member. Membership generally entitles one to the publications of the profession and the right to attend its meetings.

SBMI students may obtain student memberships in discipline specific organizations. Discipline specific organizations include AMIA (American Medical Informatics Association), ACM (Association for Computing Machinery), IEEE (The Institute of Electrical and Electronics Engineers, Inc.), HANIA (Houston Area Nursing Informatics Association), HIMSS (Hospital Information and Management Systems Society), and UTHealth BioEngineering Group. The Associate Dean for Academic Affairs can provide information about student memberships available in these organizations, and further information may be found at http://www.sbmi.uth.tmc.edu/.

SBMI Research Centers

The Center for Biosecurity and Public Health Informatics Research

The Center for Biosecurity and Public Health Informatics Research (CBPHIR) was established by SBMI to coordinate research and development of next generation informatics infrastructures and technological platforms relevant to the public health preparedness, bioterrorism readiness, emergency response and situation awareness.

The Center promotes collaborative research and technology development activities in the context of:
- Bioterrorism Preparedness (Situation Awareness), Emergency Response and Command, Control and Communication, in City, County, State and National levels.
- Education, Training and Drill for emergency response and mass casualty event preparedness, using state of the art information technologies
- Community Awareness and Public Preparedness Services
- Biomedical, Clinical and Public Health Informatics

The primary mission and objectives of the Center are to be the pioneering research entity nation- wide, designing and developing the next generation of information systems and emergency response management infrastructure for public health preparedness. The center promotes a multidisciplinary collaboration environment between university researchers, private enterprises and government agencies to provide state of the art technologies, research and development infrastructures and training, education and drill opportunities for the students, scientists, and for the community.

This overall mission is supported by three other goals that differentiate this effort from other local initiatives:

1. To establish a "Center of Excellence" from a cluster of scientists, researchers and students of different domains to:
   a. Identify needs and develop the rationale to deploy new technologies.
   b. Provide a continuous source of grant support.
   c. Collaboratewithinaninter-disciplinaryprogramtotranslateortransfertechnologies from different domains.
2. Establish an advanced and state-of-the-art training and learning laboratory to simulate, experiment and study public health and environmental incidents in a multi-disciplinary environment.
3. Develop technologies relevant to community services to enhance vigilance, awareness and public preparedness.

Center for Computational Biomedicine

Over the past several years, computational issues for technology-driven biomedical research have proliferated. The Center for Computational Biomedicine (CBM) at SBMI pursues collaborative, interdisciplinary research and education within the broadly defined scientific area of computational biomedicine. This new discipline is defined by and indeed resides upon the interface between the computational sciences (i.e., signal analysis, data mining and computer science in general) and a wide variety of biomedical disciplines including neuroscience, genomics, cardiology and structural biology to name a few. Fundamentally, CBM addresses the modeling, acquisition, processing and long-term storage of the ever-increasing volume of biomedical information.

The Center for CBM encourages the development of collaborative relationships among faculty and others around research and education in CBM related to the mission of the university. The Center for CBM emphasizes the highly

interdisciplinary nature of this emerging scientific discipline in health care and biomedical research. The Executive Committee of the Center is composed of representatives from each of the other five UTHealth schools.

Gulf Coast Regional Extension Center

The mission of the Gulf Coast Regional Extension Center (GCREC) is to facilitate safe, effective, and meaningful use of state-of-the-art health information technology by all healthcare providers in the region by focusing on primary care practices and their integration with local, state, and federal Health Information Exchange activities with the ultimate goal of improving the health of the citizens they serve. The Center's priority is helping providers fully understand and take advantage of the full benefits of electronic health records. The Center enables providers to achieve meaningful use objectives, minimize financial and administrative burdens, reduce costs associated with medical errors, improve patient safety and quality of care and prepare and position providers for future pay for performance.

National Center for Cognitive Informatics and Decision Making in Healthcare

National Center for Cognitive Informatics and Decision Making in Healthcare (NCCD) is funded by the Office of the National Coordinator for Health IT under the Strategic Health IT Advanced Research Projects (SHARP) Program, which seeks to support improvements in the quality, safety and efficiency of health care through advanced information technology.

NCCD carries out interdisciplinary research projects to address the cognitive challenges identified by ONC which include:
- Work-Centered Design
- Cognitive Foundations for Decision Making
- Adaptive Decision Support
- Model-based Data Summarization
- Visualization and Distributed Team Work

Educational Programs

Health Informatics

Health Informatics is the study of how health data are collected, stored, and communicated; how these data are processed into health information suitable for scientific, administrative and clinical decision making; and how computers and telecommunications technology can be applied to support these processes. Health informaticians are in great demand and may work in various clinical, research and educational environments.

Essential Skills for Health Informaticians

Health Informatics is a collaborative discipline that builds on several other fields such as information sciences, biomedicine, computer science, and mathematics. Proficiency in each of these areas is necessary to work in health informatics. Courses are available to assist students with gaining competencies in these foundation areas, since solid background knowledge in these support areas is consistent with student success in the study of Health Informatics.

Communication skills are very important to the field of informatics. Admitted students with a verbal GRE score below 640 or MAT score below 432 must successfully complete a technical writing course.

To successfully perform the duties of a health informatician, an individual must be able to think critically and analytically, must demonstrate motivation, and must have a technical understanding of the computing environment that is the basis for informatics work. Students must be able to address problems in a clear and innovative manner. Other requirements include the ability to communicate in English both verbally and in writing at the college level and to work in interdisciplinary teams. Depending on their application area, students must have demonstrable competence with a programming language, college algebra, computer literacy skills, anatomy, physiology, health language, clinical care, and operational characteristics of healthcare.

Program Philosophy

The ultimate goal of the program is to use informatics to improve the health of the people of Texas. The School strongly believes that healthcare will increasingly require a cooperative interaction among the health disciplines. The result will be practitioners who understand the technology, data, information, knowledge, assumptions and decision making of others as they attempt to design, provide and evaluate healthcare in the 21st century.

To that end, the Health Informatics Program stresses the development of interdisciplinary teams to evaluate and address the complex informatics issues that will face healthcare in the next century. Students will enter the Health Informatics Program with a strong base from their previous undergraduate or graduate studies, and will study how to communicate knowledge across traditional, professional, and organizational barriers. As they progress, students will acquire the principles and knowledge needed to organize, store, display, communicate, and evaluate that knowledge across a variety of systems: electronic, social, and political.

The Health Informatics Program will start from a strong scientific base and move to the application of informatics to a variety of areas related to the interests of students and faculty. These areas of interest may include, but are not limited to computational knowledge, electronic health record system, tele-health, patient-focused information systems, and computational biomedicine.

Health Informatics is always undergoing rapid change. New technologies, conceptual understandings, and computational processes ensure that the future will bring increasing rates of change and development. Students will

have the knowledge and skills to address present issues and the adaptability to address future ones. The Health Informatics Program will strive to meet the needs of students, develop new research to advance the frontiers of the science, and be an active participant in the development and application of informatics initiatives in the community.

Program Description

The Program in Health Informatics is designed to be transdisciplinary in its focus. The Program is the first in the United States that does not reside in a discipline-specific professional school. Students come from a variety of disciplines, and work in interdisciplinary teams to better understand the knowledge unique to each discipline and how that knowledge must be translated for use by other disciplines. In developing this program, the School has worked with representatives from Texas A&M University, Baylor College of Medicine, Rice University, the University of Houston, The University of Texas Medical Branch at Galveston, The University of Texas Health Science Center at San Antonio, and Texas Woman's University to improve opportunities for students entering the Health Informatics Program and to create new electives available to the other schools.

The certificate, master's and doctoral degree programs incorporate an interdisciplinary and integrative design that is believed to be unique to the field of health informatics in the United States. Many existing informatics master and doctoral programs are organized around a specific discipline in which applications of informatics within that discipline are emphasized, e.g., medical informatics, nursing informatics, and dental informatics. The Health Informatics Program, on the other hand, is designed to be inherently transdisciplinary and integrative. This means that the fundamental informatics concepts that transcend and apply to all traditional healthcare disciplines will be emphasized. Moreover, these programs will identify and teach the major informatics concepts that integrate and link diverse health disciplines, creating focus on patient healthcare.

Individuals holding a baccalaureate or higher degree in a health-related discipline, computer science, engineering, or management information systems can apply for the graduate Health Informatics program. To complete the program, full-time students usually spend a year (three semesters) for the certificate program, two years (five semesters) for the master's program, and four years (12 semesters) for the doctoral program. Part-time enrollment is available for certificate and master's students. The course of study is initiated in the fall, spring and summer semesters. The deadline for completed applications for the certificate and master's programs is March 15 for the summer semester, July 1 for the fall semester, and November 1 for the spring semester. The course of study for the doctoral program is initiated in the fall semester. Deadline for completed applications is December 1 (for entry to the following fall semester).

The certificate program is a certificate of completion of 15 semester credit hours of graduate level courses.

UTHealth awards a Master of Science degree or a Doctor of Philosophy degree to students who successfully complete the degree program in Health Informatics.

Certificate for Health Informatics Program

Program Description and Goals

The School offers the Certificate for Health Informatics designed for self-motivated professionals working in the health care and information technology fields. A Certificate for Public Health Informatics is also offered.

The certificate provides professionals with an increased understanding of the opportunities and challenges involved in technology integration into healthcare. They will be able to participate in designing, planning, implementing and evaluating new software and hardware solutions at their institutions.

SBMI is experienced in providing education to working professionals. The certificate program is designed to provide quality education to professionals on their schedule. The courses are offered online for convenience of working professionals.

Upon completion of the certificate, students will be awarded a certificate of completion from UTHealth. A transcript showing graduate credits may be obtained from the Registrar's Office.

Admission to the Health Informatics Certificate Program

The admission process to the HI certificate program is designed to get the professional working applicant into the Program by meeting minimal requirements. Each applicant must submit to the Registrar's Office the following:

1. A completed certificate application online

2. $60 application fee

3. An official transcript with the minimum of a baccalaureate or higher degree in an appropriate area, e.g., science, medicine, nursing, dentistry, MIS, or computer science. All foreign college transcripts must have been evaluated on a course-by-course basic by an independent organization such as Educational Credential Evaluators or World Education Services prior to application.

4. Letter of Reference

Certificate of Completion in Health Informatics application deadlines:

Fall admission   **July 1**
Spring admission   **November 1**
Summer admission   **March 15**

Successful completion of the program requires passing each course with a grade of a "C" or above. Students may not earn more than two "C" grades. Earning a third grade of "C" results in automatic dismissal from the certificate program. Students who complete the course of study will receive a certificate of completion. The coursework earned is at the graduate level. This coursework may be transferred into a degree-seeking program. No grade lower than a "B" will be accepted to transfer into the master's or doctoral program.

Course of Study

The certificate program offers two different options. Option 1 is a set of five predetermined classes with an emphasis in Clinical Informatics:

HI 5310 Foundations of Health Information Sciences I
HI 5007 Data Structure and Algorithms in Biomedicine
HI 5313 Introduction to Electronic Health Records
HI 6312 Project Management in Healthcare
HI 6309 Healthcare Interface Design

HI 5310 Foundations of Health Information Sciences I should be taken in the first semester. The other four classes can be taken in any order.

Option 2 is the choice of five classes from the catalog. This option allows professionals interested in biomedicine or learning and technology to customize their certificate to meet their needs.

Address application inquiries to:
School of Biomedical Informatics
Office of Academic Affairs
7000 Fannin Street Suite 600
Houston, TX 77030
(713) 500-3591
SBMIAcademics@uth.tmc.edu

Certificate for Public Health Informatics Program

Program Description and Goals

This program is jointly offered by the UTHealth School of Biomedical Informatics and the UT School of Public Health at Houston. It is designed to provide professionals with an introduction to how information and information systems are applied in prevention and intervention of disease in public health populations.

Admission to the Public Health Informatics Certificate Program

The admission process to the Public HI certificate program is designed to get the professional working applicant into the Program by meeting minimal requirements. Each applicant must submit to the Registrar's Office the following:

1. A completed certificate application online

2. $60.00 application fee

3. An official transcript with the minimum of a baccalaureate or higher degree in an appropriate area, e.g., science, medicine, nursing, dentistry, MIS, or computer science. All foreign college transcripts must have been evaluated on a course-by-course basic by an independent organization such as Educational Credential Evaluators or World Education Services prior to application.

4. Letter of Reference

Certificate of Completion in Health Informatics application deadlines:

Fall admission	**July 1**
Spring admission	**November 1**
Summer admission	**March 15**

Successful completion of the program requires passing each course with a grade of a "C" or above. Students may not earn more than two "C" grades. Earning a third grade of "C" results in automatic dismissal from the certificate program. Professionals who complete the course of study will receive a certificate of completion. The coursework earned is at the graduate level. This coursework may be transferred into a degree-seeking program. No grade lower than a "B" will be accepted to transfer into the master's or doctoral program.

Course of Study and Sample Curriculum

The Public Health Informatics Certificate Program offers the following course of study:

HI 5310 Foundations of Health Information Sciences I
HI 5380 Principles and Foundation of Public Health Informatics
PH 2610 Introduction to Epidemiology
PH 1610 Introduction to Biostatistics

The fifth course is the student's choice of one of the following courses:
HI 5381 Methods in Public Health Informatics
HI 5382 Synthesis Project of Public Health Informatics

     HI 6303 Introduction to Telehealth
     HI 5313 Introduction to Electronic Health Records
     PH 3715 Introduction to Management and Policy Sciences
     PH 1110 Social and Behavioral Aspects of Community Health
     PH 2120 Man's Impact on the Environment

PH 1610 Introduction to Biostatistics, PH 2610 Introduction to Epidemiology, HI 5310 Foundations of Health Information Sciences I, or HI 5380 Principles and Foundation of Public Health Informatics should be taken in the first semester.

Address application inquiries to:
School of Biomedical Informatics
Office of Academic Affairs
7000 Fannin Street Suite 600
Houston, TX 77030
(713) 500-3591
SBMIAcademics@uth.tmc.edu

Certificate for Applied Health Informatics Program

Program Description and Goals

The School offers the Certificate for Applied Health Informatics designed for self-motivated professionals working in the health care and information technology fields. The certificate helps meet the workforce needs for Health Information Technology (HIT) and provides professionals with knowledge and skills to assess, implement, maintain and evaluate Electronic Health Records (EHRs) and health information systems. The targeted student population includes Clinician/Public Health leader, Health Information Management and Exchange Specialist.

SBMI is experienced in providing education to working professionals. The certificate program is designed to provide quality education to professionals on their schedule. The courses are offered online for convenience of working professionals.

Upon completion of the certificate, students will be awarded a certificate of completion from UTHealth. A transcript showing graduate credits may be obtained from the Registrar's Office.

Admission to the Applied Health Informatics Certificate Program

The admission process to the certificate program in Applied Health Informatics is designed to get the professional working applicant into the Program by meeting minimal requirements. Each applicant must submit to the Registrar's Office the following:

1. A completed certificate application online

2. $60.00 application fee

3. An official transcript with the minimum of a baccalaureate or higher degree in an appropriate area, e.g., science, medicine, nursing, dentistry, MIS, or computer science. All foreign college transcripts must have been evaluated on a course-by-course basic by an independent organization such as Educational Credential Evaluators or World Education Services prior to application.

4. Letter of Reference

Certificate for Applied Health Informatics application deadlines:

Fall admission	**July 1**
Spring admission	**November 1**
Summer admission	**March 15**

Successful completion of the program requires passing each course with a grade of a "C" or above. Students may not earn more than two "C" grades. Earning a third grade of "C" results in automatic dismissal from the certificate program. Professionals who complete the course of study will receive a certificate of completion. The coursework earned is at the graduate level. This coursework may be transferred into a degree-seeking program. No grade lower than a "B" will be accepted to transfer into the master's or doctoral program.

Course of Study

The certificate requires completion of five graduate courses. The program offers two different options. Option 1 is a set of five predetermined courses with an emphasis in Electronic Health Records (EHRs).

HIT 5300 Introduction to Applied Health informatics
HIT 5301 The US Healthcare System
HIT 5303 Safety and Security in Healthcare
HIT 5326 Assessments in Applied Health Informatics
HIT 5327 Standards and Standards Development in Applied Health informatics

HIT 5300 should be taken in the first semester. The other four courses can be taken in any order.

Option 2 is the student's choice (with advice from the certificate director) of five courses selected from the course set of the school's Master of Science program in Applied Health Informatics. This option allows professionals to customize their studies to meet their background and needs.

Address application inquiries to:
School of Biomedical Informatics
Office of Academic Affairs
7000 Fannin Street Suite 600
Houston, TX 77030
(713) 500-3591
SBMIAcademics@uth.tmc.edu

Master of Science in Health Informatics Program

Program Description and Goals

The formal study of informatics at the master's level is designed as a multi-disciplinary approach to accomplish these important goals:

1. Understand the scope of the discipline of health informatics;
2. Demonstrate knowledge of the literature of health informatics;
3. Demonstrate skills in knowledge engineering and knowledge structuring;
4. Apply the acquired skills set in a selected domain of health informatics;
5. Develop informatics solutions to biomedical problems based on current research; and,
6. Understand opportunities and limitations of current technologies used in health informatics.

To accomplish a trans-disciplinary and integrative structure and to allow students to select courses appropriate to their backgrounds and professional goals, the Health Informatics curriculum has been conceptualized as a matrix. Each cell of the matrix represents a learning experience in three areas: basic informatics, research, and advanced informatics. Within the curriculum, each student, in cooperation with the student's Advising Committee, will select the combination of courses and experiences that most directly meets the student's educational needs.

Master of Science in Health Informatics Admission Process

The applicant should present to the Registrar's Office the following:

1. Official transcripts from every post-secondary school attended, both in the United States and abroad. All foreign transcripts must be evaluated by a professional agency (such as Educational Credential Evaluators or World Education Services) on a course-by-course basis. This evaluation is at the applicants' expense.
2. A baccalaureate or higher degree in an appropriate area, e.g., science, medicine, nursing, dentistry, MIS, engineering, or computer science
3. A personal statement detailing the applicant's interest in the program
4. A resume or curriculum vitae (as appropriate)
5. A Graduate Record Exam (GRE) or Miller Analogies Test (MAT) score
6. Grade Point Average (GPA) in previous (degrees) coursework
7. A minimum TOEFL score of 550 on the paper test; a score of 87 (writing 26, speaking 23, reading 21, listening 17) on the internet based test; or a minimum score of 213 on the computer test is required for international students.
8. Three letters of reference from educators and/or employers
9. Courses taken and degrees received at U.S. schools must be from regionally accredited schools.

Applicant materials will be organized into a portfolio for review by the admissions committee. The admissions committee will consider such areas as:

- Health, MIS, Computer, or Engineering related degree
- Health-care work experience
- Database work experience

- Informatics work experience
- Demonstrated expertise in programming
- GRE or MAT score
- GPA in previous degree
- Success in overcoming social, economic or educational disadvantages, race and ethnicity.

Master of Science in Health Informatics application deadlines:

Fall admission	**July 1**
Spring admission	**November 1**
Summer admission	**March 15**

Interview

The second component for admission is a personal interview. Applicants who have been recommended by the admissions committee may be invited to interview with two faculty members. Faculty members are either requested by the applicant or assigned by the admissions committee. Separate interviews may be conducted due to scheduling conflict. The interview is expected to focus on the applicant's goals and how they can be achieved in the master's program, communication skills, and understanding of the program.

Transfer Credit

Transfer credit for equivalent courses taken elsewhere may be awarded and used to meet degree requirements if their equivalency to a SBMI degree program course is approved through a Petition for Equivalency Credit.

Support courses that are taken at other institutions that enhance a student's degree plan should be determined by agreement and approved by their advising committee. A Petition for Equivalency Credit is not required for these support courses. Contact the Office of Academic Affairs for information.

The maximum number of transferable semester credit hours is 12 for the master's program.

Applicants who are presenting coursework from universities or colleges outside the United States to meet admission or graduation requirements are referred to the section on International Applicants in this catalog for a listing of additional requirements.

Degree Requirements for the Master of Science in Health Informatics

Academic Requirements

Credit hours must total at least 42 semester hours for all courses in the degree plan. Six of those semester credit hours will be in support courses that might not be offered by the school. Support courses could include areas such as cognitive sciences from Texas A&M University, computer science from Rice University, mathematics from the University of Houston, measurement courses from The University of Texas School of Nursing at Houston, or courses studying healthcare outcomes from The University of Texas School of Public Health at Houston. Each student follows a degree plan developed with an Advising Committee. A total of 42 semester credit hours must be completed prior to graduation.

A full-time student in the Program in Health Informatics has up to four years (12 semesters) from the time of entry to complete the required course work. A part-time student has up to eight years (24 semesters) from the time of entry to complete the required course work. Continuous enrollment is required unless approval from the advising committee is obtained. A maximum of one year of an approved leave of absence will be allowed for continuance in the program. If more than one year of leave occurs, the student must apply for readmission to the program.

Each course with an HI prefix in the Health Informatics degree plan is a graduate-level course and should be passed with a grade of "B" or better. Only one course grade of "C" is allowed. The minimum grade point average (GPA) required for graduation is 3.0 on all HI courses.

Other Requirements

In Residence Requirement: The term "in residence" refers to the requirement that a student completes a total of 30 semester credit hours over the course of the program at UTHealth. A student must fulfill his or her in residence requirement in order to receive any academic degree from the School.

Computer Requirement

Every student is required to have reliable access to a computer that meets the minimum requirements. Students are encouraged to purchase a laptop that meets the minimum UTHealth requirements.

Computer requirements are listed on the website (http://www.uthouston.edu/sbmi/current-students/student-handbook/computer-requirements.htm) and are subject to change.

Course of Study for the Master of Science in Health Informatics

The curriculum of the Master of Science degree in Health Informatics includes required didactic courses and a practicum. Didactic courses (lecture/discussion, demonstration and student laboratories) are presented to provide facts, concepts, and theories related to the techniques and procedures of health informatics. The courses include instruction in basic informatics, research, advanced informatics and support courses. The practicum is designed to give the students the opportunity to apply theory and techniques in the hospital, research, or private laboratory setting.

Each student will develop a degree plan with written approval of their advising committee. A degree plan will be filed that includes a minimum of:

- 6 semester credit hours in foundation courses
- 6 semester credit hours in basic informatics
- 6 semester credit hours in research informatics
- 3 semester credit hours in advanced courses
- 6 semester credit hours in support courses
- 6 semester credit hours in practicum courses.

Changes to the degree plan must be approved in advance in writing by the advising committee.

The Advising Committee must approve support courses before a student enrolls in the course unless the courses are transferred and accepted for credit at the time of admission. Approval of the transferred courses must be

completed at the time of transfer to the program. Only six semester credit hours of support courses will be accepted toward the degree requirements.

Practicum

Prior to beginning the practicum, the student must submit to the Office of Academic Affairs a copy of their proposal. The proposal must be approved in writing by all members of the advising committee. Another part of the practicum that students must prepare is a 'state of the science' paper based on research in the student's area of interest. The 'state of the science' paper will be developed in cooperation with the student's advising committee. Students will have the experience of disseminating the knowledge they have gained by sharing it with the larger community. It will not be a requirement that the paper actually be published, due to the inability to predict journal-publishing times. However, the paper must be of sufficient quality to be accepted for publication in a refereed journal and must be submitted for publication. The advising committee will be responsible for monitoring the quality of this paper, as well as the practicum. The 'state of the science' paper approach has been chosen because it gives more flexibility to conduct different kinds of research, such as concept analysis, discussion of implementation issues, or investigation of new data in Health Informatics. All research papers, theses, and dissertations authored by degree candidates are available to interested members of the general public upon request.

Sample Curriculum

Course No. Course Title	Semester Credits
Fall Semester	
HI 5310 Foundations of Health Information Sciences I	3
HI 5352 Statistical Methods in Health Informatics	3
HI 5354 Cognitive Engineering in Health Informatics	3
	Total 9
Spring Semester	
HI 5351 Research Design and Evaluation in Health Informatics	3
HI 5304 Advanced Database Concepts	3
HI 5311 Foundations of Health Information Sciences II	3
	Total 9
Summer Semester	
HI 5313 Introduction to Electronic Health Records	3
HI 6314 Knowledge Acquisition	3
	Total 6
Fall Semester	
HI 6301 Health Data Display	3
HI 6308 Consumer Informatics	3
Support Course 1	3
	Total 9
Spring Semester	
HI 6000 Practicum in Health Informatics	6
Support Course 2	3
	Total 9
	Grand Total 42

For further curriculum information, please contact:

UTHealth School of Biomedical Informatics
Office of Academic Affairs
7000 Fannin Street Suite 800
Houston, Texas 77030
Telephone: (713) 500-3591
Email: SBMIAcademics@uth.tmc.edu

Master of Science in Applied Health Informatics Program

Program Description and Goals

Formal study of applied health informatics at the master's level is designed to accomplish these important goals:

1. Acquire an understanding of the scope of the applied health informatics area;
2. Demonstrate knowledge of the applied health informatics domain;
3. Demonstrate skills in Electronic Health Records (EHR) and computerized health information systems;
4. Apply the skills set the area of applied health informatics;
5. Develop problem solving skills for applied health informatics' problems;
6. Understand opportunities and limitations of current technologies used in applied health informatics.

The Master Program in Applied Health Informatics is directed toward creating an educated workforce with the knowledge and skills to assess, implement, maintain and evaluate Electronic Health Records (EHRs) and computerized health information systems. The program requires 36 semester credit hours. Each course consists of didactic and laboratory coursework, plus a capstone project. The courses investigate a broad selection of areas such as the modern American healthcare system, healthcare legislation, primary care facilities, electronic health records, health information security protocols, project management, and change management. The program culminates with a capstone project that requires the student to apply knowledge and skills learned from coursework in a practical real world setting.

The Applied Health Informatics Program is an online program.

Master of Science in Applied Health Informatics Admission Requirements

The applicant should present to the Registrar's Office the following:

1. Official transcripts from every post-secondary school attended, both in the United States and abroad. All foreign transcripts must be evaluated by a professional agency (such as Educational Credential Evaluators or World Education Services) on a course-by-course basis. This evaluation is at the applicants' expense.
2. A baccalaureate or higher degree in an appropriate area, e.g., science, medicine, nursing, dentistry, MIS, engineering, or computer science
3. A personal statement detailing the applicant's interest in the Applied Health Informatics Program
4. A resume or curriculum vitae (as appropriate)
5. A Graduate Record Exam (GRE) or Miller Analogies Test (MAT) score
6. Grade Point Average (GPA) in previous (degrees) coursework
7. A minimum TOEFL score of 550 on the paper test; a score of 87 (writing 26, speaking 23, reading 21, listening 17) on the internet based test; or a minimum score of 213 on the computer test is required for international students.
8. Two letters of reference – one from an educator and one from an employer.
9. Courses taken and degrees received at U.S. schools must be from regionally accredited schools.

Applicant materials will be organized into a portfolio for review by the admissions committee. The admissions

committee will consider such areas as:

- Health, MIS, Computer, or Engineering related degree
- Previous Health-care and/or work experience
- Database work experience
- Informatics work experience
- Demonstrated expertise in programming
- GRE or MAT score
- GPA in previous degree
- Success in overcoming social, economic or educational disadvantages, race and ethnicity

Master of Science in Applied Health Informatics application deadlines:

Fall admission	**July 1**
Spring admission	**November 1**
Summer admission	**March 15**

Transfer Credit

Transfer credit for equivalent courses taken elsewhere may be awarded and used to meet degree requirements, if their equivalency to a SBMI degree program course is approved through a Petition for Equivalency Credit. The maximum number of transferable semester credit hours is six for the applied master's program.

Applicants who are presenting course work from universities or colleges outside the United States to meet admission or graduation requirements are referred to the section on International Applicants in this catalog for a listing of additional requirements.

Degree Requirements for the Master of Science in Applied Health Informatics

Academic Requirements

Credit hours must total at least 36 semester hours for all courses in the degree plan. Each student will follow a degree plan developed with an Advising Committee.

A full-time student in the Applied Health Informatics Program has up to four years (12 semesters) from the time of entry to complete the coursework. A part-time student has up to eight years (24 semesters) from the time of entry to complete the required coursework. Continuous enrollment is required unless approval from the advising committee is obtained. A maximum of one year of an approved leave of absence will be allowed for continuance in the program. If more than one year of leave occurs, the student must apply for readmission to the program.

Each course with a HIT prefix in the Applied Health Informatics degree program is a graduate level course and should be passed with a grade of "B" or better. Only one course grade of "C" is allowed. The minimum grade point average (GPA) required for graduation is 3.0 in all HIT courses.

Other Requirements

In Residence Requirement: The term "in residence" refers to the requirement that a student completes 30 semester credit hours over the course of the program at UTHealth. A student must fulfill his or her in residence requirement in order to receive any academic degree from the School.

Computer Requirements

Every student is required to have reliable access to a computer that meets the minimum requirements. Students are encouraged to purchase a laptop that meets the minimum UTHealth requirements.

Computer requirements are listed on the website (http://www.uthouston.edu/sbmi/current-students/student-handbook/computer-requirements.htm) and are subject to change.

Course of Study for the Master of Science in Applied Health Informatics

The curriculum of the Master of Science degree in Applied Health Informatics includes required didactic courses, practicums and a capstone experience. Didactic courses (lecture/discussion, demonstration and student practicums) are presented to provide facts, concepts, and theories related to the techniques and procedures of the applied health informatics area.

The practicums are designed to provide students the opportunity to apply theory and techniques in the hospital, research, or private healthcare settings. The Program in Applied Health Informatics consists of 36 Semester Credit Hours (SCH). The part-time student has up to two and a half years (8 semesters) from the time of entry to complete the required course work.

Each student has a designated degree plan that must successfully be completed to satisfy the program requirements. Each student will be assigned an advisor. The Applied program is designed as an online program only. The three-hour practicum and capstone project are both required so that students receive real world experience.

Sample Curriculum

Course No. Course Title	Semester Credits
Spring Semester	
HIT 5300 Introduction to Health Informatics	3
HIT 5301 The U.S. Healthcare System	3
HIT 5302 Communication in Applied Health Informatics	3
HIT 5320 Applied Health Information Systems in the Delivery of Healthcare	3
HIT 5000 Practicum in Applied Health Informatics	1
	Total 13
Summer Semester	
HIT 5324 Project Management in Applied Health Informatics	3
HIT 5327 Standards and Standards Development in Applied Health Informatics	3

HIT 5326	Assessments in Applied Health Informatics	3
HIT 5000	Practicum in Applied Health Informatics	1
		Total 10

Fall Semester

HIT 5303	Safety and Security in Applied Health Informatics	3
HIT 5325	Social Dynamics in Applied Health Informatics	3
HIT 5323	Evaluation of Health Information Systems in Applied Health Informatics	3
HIT 5322	Systems Analysis in Applied Health Informatics	3
HIT 5000	Practicum in Applied Health Informatics	1
		Total 13
		Grand Total 36

For further curriculum information, please contact:

Juliana Brixey PhD, RN
7000 Fannin Street Suite 600
Houston, TX 77030
713-500-3643
Juliana.J.Brixey@uth.tmc.edu

Doctor of Philosophy in Health Informatics

Program Description and Goals

This program is designed to be a research based trans-disciplinary program involving students with a variety of backgrounds. Students will work together in teams to research real clinical and biomedical health problems. They will gain both the scientific background for research and skills needed to address problems. The program is designed to meet the unique needs of each student by using a matrix curriculum plan with an advising committee to guide each student from admission through graduation. Each student must have a faculty academic advisor to guide each student through participation in research projects.

The doctoral program in Health Informatics is conceptualized and designed to be inherently trans-disciplinary and integrative. This means that the fundamental informatics concepts that transcend and apply to all traditional healthcare disciplines will be emphasized in the doctoral program. This program will identify and teach the major informatics concepts that integrate and link diverse health disciplines.

The doctoral program in Health Informatics is constructed as a post-baccalaureate degree that not only addresses the knowledge and skills that the student brings at admission, but allows the student to build on previous knowledge and skills in order to attain the research focus needed for the completion of the doctoral program in Health Informatics.

Students admitted to the master program can apply to the doctoral tract by meeting the same admission requirements as those who apply directly to the doctoral program. Full admission to the doctoral program occurs only after the student successfully advances to candidacy.

Admission is limited to students who are matched with faculty members' area of research, scholarship, and teaching expertise.

Formal study of informatics at the doctoral level at UTHealth is designed to accomplish these major goals:

- Expand the scope of the discipline of Health Informatics

- Demonstrate familiarity with the health informatics research literature, including in-depth knowledge of a selected health informatics research area.

- Research and evaluate new regions or domains in Health Informatics

- Lead interdisciplinary teams in the search for solutions to Health Informatics problems

- Effectively communicate research findings to peers and to practitioners who can use the research findings.

Each student will be assigned an academic advisor (a full-time SBMI faculty member) and advising committee that will oversee that student's progress from admission to graduation. The advising committee shall be composed of the student's academic advisor, at least one other full-time SBMI faculty member, and a third faculty member who represents the student's interest or discipline area. The student's academic advisor will chair the advising committee. The advising committee will guide the student in the selection of courses, designation of a preceptorship site, and the development of the student's research interests. This continuity between the student

and the advising committee will allow the faculty to understand the student's strengths and allow the student to explore areas that need to be strengthened, while allowing the student to meet individual goals for graduate research education. Students will be encouraged to work cooperatively with faculty at other institutions.

The doctoral program is a 93-semester credit hour full-time program developed as a post baccalaureate program. Each cell of the matrix represents a learning experience in each of the four areas: basic informatics, research informatics, advanced informatics, and area of research interest. The program may be allowed at part-time enrollment. Part-time enrollment requires written approval of the advisor and advising committee.

Doctor of Philosophy in Health Informatics Admission Process

The applicant should present a completed application and official documentation of the following to the Registrar's Office:

1. Official transcripts from every post-secondary school attended, both in the United States and abroad. All foreign transcripts must be evaluated by a professional agency (such as Educational Credential Evaluators or World Education Services) on a course-by-course basis. This evaluation is at the applicants' expense.
2. A baccalaureate or higher degree in an appropriate area, e.g., science, medicine, nursing, dentistry, MIS, engineering, or computer science.
3. A resume or curriculum vitae (as appropriate)
4. A Graduate Record Exam (GRE) score or Miller Analogies Test (MAT) score (required)
5. Grade Point Average (GPA) in previous degrees
6. A minimum TOEFL score of 550 on the paper test; a score of 87 (writing 26, speaking 23, reading 21, listening 17) on the internet based test; or a minimum score of 213 on the computer test is required for international students.
7. Submit a brief (no more than three pages single-spaced, 12 point font size) personal statement that addresses the following items:
   a. A brief summary of your background in all relevant fields, such as biomedicine, mathematics, and computer science; describing research experience and any results that were generated in research work. Provide dates, research advisors, project titles, and references to publications.
   b. A statement of educational goals and how these goals would be advanced through the PhD program.
   c. A statement of short- and long-term career objectives, including specific information regarding short-term objectives, (any projects you may have in mind for your PhD work). Be sure to include how those objectives fit the opportunities provided by the SBMI educational and research environments.
8. Courses taken and degrees received at U.S. schools must be from regionally accredited schools.
9. Three letters of reference from educators and/or employers.

Doctor of Philosophy in Health Informatics application deadline:

Fall admission   December 1

Review by the Admissions, Progression, and Graduation (APG) Committee

Applicant materials will be organized into a portfolio for review by the admissions committee. The admissions committee will review the materials and recommend whether applicants will be offered an interview—the next step in the admissions process. The criteria that the committee considers are the same as for the master's program

including prior research experience. Students who are recommended for an interview will be contacted by Office of Academic Affairs to schedule an interview.

Interview

Applicants who proceed to the next level of the admission process will be interviewed by faculty members. Separate interviews may be conducted due to scheduling conflict. The interview will focus on the applicant's research goals and how they will be achieved in the doctoral program.

Faculty Governance Organization (FGO) Review and Recommendation

All interviewed applicants will be presented and discussed at a Faculty Governance Organization meeting. An admission recommendation by the FGO will be made to the Associate Dean for Academic Affairs.

Transfer Credit

Transfer credit for courses taken at other universities or institutions, submitted to meet part of the degree requirements, may be awarded following review and written approval by the student's faculty academic advisor and the Associate Dean for Academic Affairs. The maximum number of transferable credit hours for the doctoral program is 36 semester credit hours.

Credit for courses taken at other universities or institutions that are offered at SBMI is granted only through Petition for Equivalency Credit. Credit for support courses taken at other universities or institutionsis approved by the students' advising committee. Contact the Office of Academic Affairs for more information.

Applicants who are presenting coursework from universities or colleges outside the United States in order to meet graduation requirements should refer to the section on International Applicants for additional requirements.

Financial Assistance

Financial assistance packages and research assistantships will be available to all students on a competitive basis to facilitate full-time doctoral education.

Degree Requirements for the Doctor of Philosophy in Health Informatics

Academic Requirements

A total of 93 semester credit hours must be completed prior to graduation. Six of those semester credit hours will be in support courses not offered by the School. The support courses could include areas such as cognitive science and computer science from Rice University, mathematics from the University of Houston, measurement courses from the University of Texas School of Nursing at Houston, or courses studying healthcare outcomes and biostatistics from the University of Texas School of Public Health at Houston.

A full-time student in the Program in Health Informatics has up to eight years from the time of entry to complete the required coursework. Continuous enrollment is required unless approval from the advising committee is obtained. A maximum of one year of an approved leave of absence will be allowed for continuance in the program. If more than one year of leave occurs, the student must apply for readmission to the program.

Each course with an HI prefix in the Health Informatics degree plan is a graduate-level professional course and should be passed with a grade of "B" or better. Only one course grade of "C" is allowed. The minimum GPA required for graduation is 3.0 on all HI courses.

Other Requirements

In Residence Requirement: The term "in residence" refers to the requirement that a student completes 57 semester credit hours over the course of the program at UTHealth. A student must fulfill his or her in residence requirement in order to receive a doctoral degree from the School.

Course of Study for the Doctor of Philosophy in Health Informatics Program

The curriculum of the doctoral degree in Health Informatics includes required didactic courses and preceptorship courses. Didactic courses (lecture/discussion, demonstration and student laboratories) are presented to provide facts, concepts, and theories related to the techniques, and procedures of health informatics. They include instruction in basic informatics, research, advanced informatics and support courses. The preceptorship courses are designed to give students the opportunity to apply theory and techniques in the hospital, research, or private laboratory setting.

Each student will develop his or her curriculum with approval of the advising committee. A degree plan will be filed with the approval of the advising committee that includes a minimum of:

- 6 semester credit hours in foundational courses
- 9 semester credit hours in basic informatics,
- 12 semester credit hours in research,
- 9 semester credit hours in advanced courses,
- 6 semester credit hours in support courses,
- 9 semester credit hours in preceptorship courses,
- 21 semester credit hours in a specific research area approved by the mentor,
- 3 semester credit hours of research seminar, and
- 9 semester credit hours of dissertation.

Changes to the degree plan must have the written approval of the advising committee. The advising committee must approve all courses as part of the degree plan.

Advance to Candidacy

The student must have completed 36 semester credit hours before taking the exam. The exam must be completed before the student takes more than 58 semester credit hours. The candidacy exam will consist of a written and oral presentation of the student's proposed research topic. The student will submit the written proposal to all Health Informatics faculty at least 10 working days prior to the oral presentation. The oral presentation will be open to all students, faculty, adjunct faculty, and interested parties. The exam must be completed at the 58 hour limit or a defense will be scheduled the morning of the posters session of the semester in which the student earned the 58th hour.

All faculty present at the oral presentation cast a vote to pass or fail the student. A student passes if the majority of the faculty present vote to pass and the student's mentor votes to pass. The student's mentor is included in the number of faculty present when calculating the number of votes needed to achieve a majority. If the student passes, he or she is admitted to candidacy. If the student fails, the faculty can recommend failure without another

attempt or failure with the opportunity to re-defend within 30 days. If the student again fails the exam, he or she will be given the option of completing a Master of Science in Health Informatics degree, but will otherwise be dismissed from the doctoral program.

Advanced Preceptorship

Advanced Preceptorship is required for all PhD students. During Advanced Preceptorship you will develop and prepare your Advance to Candidacy Proposal including: defining your proposed research agenda; a review of the literature; research design, procedure and data analysis; collecting preliminary data; and scientific contribution to the discipline. The student's faculty academic advisor and advising committee must approve the focus of the research. See the SBMI Student Handbook for further details.

Research in Health Informatics

The research in Health Informatics will be based upon the proposal that the student submitted for the advance to candidacy exam. The student will obtain a clear understanding of the domain of knowledge and research methods needed to complete the dissertation research. The student will use this time to develop a unique research focus under the guidance of the academic advisor.

Dissertation

The faculty believes that communication and dissemination is a critical aspect of the research process. The student will have two options available for the dissertation. The first option will consist of three articles that are accepted for publication. Publication must be in journals or proceedings, which are both, peer reviewed and indexed for academic retrieval. The three papers are combined with an introduction and summary and bound as a dissertation. The second option requires the student to write a monograph or dissertation. The monograph will review the literature, research approaches and options, the data design and gathering processes. The findings and data will be discussed in the context of the published literature. The monograph will be bound.

The dissertation must be presented at an oral defense that is open to the public. All research papers, theses, and dissertations authored by degree candidates are available to interested members of the general public upon request. After the presentation, the students' advising committee votes to pass or fail the student. If the student passes and all degree requirements have been met, the advising committee makes its recommendations to the Associate Dean for Academic Affairs whether to award the degree.

Sample Curriculum

Course No.	Course Title	Semester Credits
Fall Semester		
HI 5310	Foundations of Health Information Sciences I	3
HI 5352	Statistical Methods for Health Informatics	3
HI 5313	Introduction to Electronic Health Records	3
		Total 9
Spring Semester		
HI 5311	Foundations of Health Information Sciences II	3
HI 5351	Research Design and Evaluation in Health Informatics	3
HI 5304	Advanced Database Concepts	3
		Total 9

Summer Semester

HI 6301	Health Data Display	3
HI 5354	Cognitive Engineering in Health Informatics	3
		Total 6

Fall Semester

HI 5002	Directed Study in Health Informatics	3
HI 6308	Consumer Informatics	3
	Support Course 1	3
		Total 9

Spring Semester

HI 7000	Preceptorship in Health Informatics	6
	Support Course 2	3
		Total 9

Summer

HI 6311	Advanced Decision Analysis I	3
HI 6309	Healthcare Interface Design	3
		Total 6

Fall Semester

HI 7301	Grant Writing	3
HI 6351	Triangulation Methods in HI Research	3
HI 6302	Knowledge Modeling	3
		Total 9

Advance to Candidacy Exam

Spring Semester

HI 7050	Research in Health Informatics	6
HI 9999	Dissertation	3
HI 7150	Research Seminar	1
		Total 10

Summer

HI 9999	Dissertation	6
		Total 6

Fall Semester

HI 7000	Preceptorship in Health Informatics	3
HI 7050	Research in Health Informatics	6
HI 7150	Research Seminar	1
		Total 10

Spring Semester

HI 7050	Research in Health Informatics	9
HI 7150	Research Seminar	1
		Total 10
		Grand Total 93

For further curriculum information, contact:

UTHealth School of Biomedical Informatics
Office of Academic Affairs
7000 Fannin Street Suite 800
Houston, Texas 77030
Telephone: (713) 500-3591
Email: SBMIAcademics@uth.tmc.edu

Master's Dual Degree Program

Program Description and Goals

The Master of Science/Master of Public Health dual degree program combines the MPH from the University of Texas School of Public Health at Houston with the MS degree from The University of Texas School of Biomedical Informatics at Houston. The training and curriculum in the dual degree program will provide students and future leaders in public health the necessary skills to be leaders in the field of Public Health Informatics. The dual degree program provides an integrated curriculum that includes a number of shared courses as well as a practicum experience and/or the thesis topic in the area of public health informatics. The selection of specific academic programs, and scheduling of specific courses, fieldwork, and practica for individual students is guided by an advising committee to satisfy admission requirements. The advising committee includes faculty from both UTHealth schools.

Students in the dual degree program must be admitted separately to each UTHealth school. Students must meet the requirements of each UTHealth school for its respective degree. Admission to one program does not ensure admission to the other. Students in the dual degree program will receive a diploma from each degree program after meeting the individual requirements of each program.

Public Health Informatics Admissions Process

Admission Requirements

The applicant should present to the Registrar's Office the following:

1. Official transcripts from every post-secondary school attended, both in the United States and abroad. All foreign transcripts must be evaluated by a professional agency (such as Educational Credential Evaluators or World Education Services) on a course-by-course basis. This evaluation is at the applicants' expense.
2. A baccalaureate or higher degree in an appropriate area, e.g., science, medicine, nursing, dentistry, MIS, engineering, or computer science
3. A personal statement detailing the applicant's interest in the program
4. A resume or curriculum vitae (as appropriate)
5. A Graduate Record Exam (GRE) or Miller Analogies Test (MAT) score
6. Grade Point Average (GPA) in previous (degrees) coursework
7. A minimum TOEFL score of 550 on the paper test; a score of 87 (writing 26, speaking 23, reading 21, listening 17) on the internet based test; or a minimum score of 213 on the computer test is required for international students.
8. Three letters of reference from educators and/or employers
9. Courses taken and degrees received at U.S. schools must be from regionally accredited schools.

Applicant materials will be organized into a portfolio for review by the admissions committee. The admissions committee will consider such areas as:

- Health, MIS, Computer, or Engineering related degree
- Health-care work experience
- Database work experience

- Informatics work experience
- Demonstrated expertise in programming
- GRE or MAT score
- GPA in previous degree
- Success in overcoming social, economic or educational disadvantages, race and ethnicity.

Master of Science in Health Informatics application deadlines:

Fall admission	**July 1**
Spring admission	**November 1**
Summer admission	**March 15**

Interview

The second component for admission is a personal interview. Applicants who have been recommended by the admissions committee will interview with two faculty members. Faculty members are either requested by the applicant or assigned by the admissions committee. If offered admission, these faculty members will become the students' advising committee. Separate interviews may be conducted due to scheduling conflict. The interview is expected to focus on the applicant's goals and how they can be achieved in the master's program, communication skills, and understanding of the program.

Transfer Credit

Transfer credit for equivalent courses taken elsewhere may be awarded and used to meet degree requirements if their equivalency to a SBMI degree program course is approved through a Petition for Equivalency Credit.

Support courses that are taken at other institutions that enhance a student's degree plan should be determined by agreement and approved by their advising committee. A Petition for Equivalency Credit is not required for these support courses.

The maximum number of transferable semester credit hours is 12 for the master's program.

Applicants who are presenting coursework from universities or colleges outside the United States to meet admission or graduation requirements are referred to the section on International Applicants in this catalog for a listing of additional requirements.

Public Health Informatics Core Competencies:

The curriculum is designed to deliver training and improve skills in the following informatics competency domains.
- The ability to determine and operationalize the existence, structure, and utility of the public health and health data standards, databases and networks within a specific domain area.
- The ability to determine, translate and operationalize the functions and operations of information technologies that have significant application to public health practice (such as graphical information systems and the web-based information dissemination) in daily public health practice.
- The ability to specify the requirements for the development and adaptation of information systems to address informational needs and requirements of a real world public health setting.
- The ability to plan, analyze, evaluate and manage implementation of public health information system projects in their organization within a specific domain area, within the core competency areas of public

health practice and in accordance with national, academic, and industrial frameworks and standards governing the design, implementation and evaluation of public health information systems and health data definitions and standards

• The ability and skill in information technology planning and procurement related to public health information systems.

Degree Requirements for the Master of Public Health Informatics

Academic Requirements

Credit hours must total at least 42 semester hours for all courses in the degree plan. Six of those semester credit hours will be in support courses, which might not be offered by the school. Support courses could include areas such as cognitive sciences from Texas A&M University, computer science from Rice University, mathematics from the University of Houston, measurement courses from The University of Texas School of Nursing at Houston or courses studying healthcare outcomes from The University of Texas School of Public Health at Houston. Each student follows a degree plan developed with an advising committee. A total of 42 semester credit hours listed in the sample curriculum matrix in this catalog for Health Informatics must be completed prior to graduation.

A full-time student in the Program in Health Informatics has up to four years (12 semesters) from the time of entry to complete the required course work. A part-time student has up to eight years (24 semesters) from the time of entry to complete the required course work. Continuous enrollment is required unless approval from the advising committee is obtained. A maximum of one year of an approved leave of absence will be allowed for continuance in the program. If more than one year of leave occurs, the student must apply for readmission to the program.

Each course with a HI prefix in the Health Informatics degree plan is a graduate level professional course and must be passed with a grade of "B" or better. Only one course grade of "C" is allowed. The minimum grade point average (GPA) required for graduation is 3.0 on all HI courses.

Other Requirements

In Residence Requirement- the term "in residence" refers to the requirement that a student completes 30 semester credit hours over the course of the program at UTHealth. A student must fulfill his or her in residence requirement in order to receive any academic degree from the School.

Computer Requirement

Every student is required to have reliable access to a computer that meets the minimum requirements. Students are encouraged to purchase a laptop that meets the minimum UTHealth requirements.

Computer requirements are listed on the website (http://www.uthouston.edu/sbmi/current-students/student-handbook/computer-requirements.htm) and are subject to change.

Course of Study for Public Health Informatics

The curriculum for the Master of Science in Health Informatics and the Master of Public Health include required didactic courses and a practicum. Didactic courses (lecture/discussion, demonstration and student laboratories) are presented to provide facts, concepts, and theories related to the techniques and procedures of public health informatics. The courses include instruction in basic informatics, research informatics, advanced informatics, public

health courses, and support courses. The public health informatics practicum is designed to give the students the opportunity to apply theory and techniques in the hospital, research, or private laboratory setting. A full-time student in the Program in Public Health Informatics has up to six years (18 semesters) from the time of entry to complete the required course work.

Each student will develop a degree plan with written approval of their advising committee. A degree plan will be filed that includes a minimum of:

- 6 semester credit hours in foundation courses
- 6 semester credit hours in basic informatics (includes 4 shared credit hours with SPH)
- 6 semester credit hours in research (includes 2 shared credit hours with SPH)
- 3 semester credit hours in advanced courses (includes 6 shared hours with SPH)
- 6 semester credit hours in support courses
- 6 semester credit hours in practicum courses.

Changes to the degree plan must have the written approval of the advising committee.

The advising committee must approve support courses before they are taken unless they are transferred in at the time of admission. Approval of the transferred courses must be completed at the time of transfer to the program. Only six semester credit hours of support courses will be accepted toward the degree requirements.

As part of the practicum, students must prepare a 'state of the science' paper based on research in the student's area of interest. The 'state of the science' paper will be developed in cooperation with the student's advising committee. Students will have the experience of disseminating the knowledge they have gained by sharing it with the larger community. It will not be a requirement that the paper actually be published, due to the inability to predict journal-publishing times. However, the paper must be of sufficient quality to be accepted for publication in a refereed journal and must be submitted for publication. The advising committee will be responsible for monitoring the quality of this paper, as well as the practicum. The 'state of the science' paper approach has been chosen because it gives more flexibility to conduct different kinds of research, such as concept analysis, discussion of implementation issues, or investigation of new data in Public Health Informatics. All research papers, theses, and dissertations authored by degree candidates are available to interested members of the general public upon request.

Program	Required Semester Credit Hours
Master's in Health Informatics (MS)	42
Master's in Public Health (MPH)	45
Total Semester Credits	**87**
Shared Courses	-13
GRAND TOTAL FOR COMBINED DEGREES	**74**

Sample Curriculum: Full-Time MPH/MS Student

Course No. Course Title | **Semester Credits**
Fall Semester
HI 5310 Foundations of Health Information Sciences I — 3
HI 5380 Principles and Foundations of Public Health Informatics — 3
PH 1110 Social and Behavioral Aspects of Community Health (shared course) — 3
Total 9

Spring Semester

PH 1690 Introduction to Biostatistics (shared course)	4
HI 5354 Cognitive Engineering I in Health Informatics	3
HI 5311 Foundations of Health Information Sciences II	3
	Total 10

Summer Semester

HI 6323 Datamining in Bioinformatics	3
	Total 3

Fall Semester

HI 6301 Health Data Display	3
Support Course 1	3
	Total 6

Spring Semester

Support Course 2	3
PH 9997 Practicum in Public Health (shared course)	3
PH 9998 Written Paper Option (shared course)	3
	Total 9

Summer Semester

HI 6000 Practicum in Health Informatics	6
	Total 6
	Grand Total 43

For Public Health Information, contact:

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Master of Public Health and Doctor of Philosophy in Health Informatics Dual Degree Program

Program Description and Goals

The MPH/PhD dual degree programs combine the MPH from the University of Texas School of Public Health at Houston with the PhD degree from the University of Texas School of Biomedical Informatics at Houston. The training and curriculum in the dual degree program will provide students and future leaders in public health the necessary skills to be leaders in the field of Public Health Informatics. The dual degree program provides an integrated curriculum that includes a number of shared courses as well as a practicum experience and/or the thesis topic in the area of public health informatics. The selection of specific academic programs and scheduling of specific courses, fieldwork, and practica for individual students is guided by an advising committee, which includes faculty from both UTHealth schools.

Students in the dual degree program must satisfy admission requirements and be admitted separately to each program. Students must meet the requirements of each program for its respective degree. Admission to one program does not ensure admission to the other. Students in the dual degree program will receive a diploma from each degree program after meeting the individual requirements of each program.

Dual Degree Application Process

The application process for the Master of Public Health is determined by the School of Public Health. The application process for the Doctor of Philosophy in Health Informatics is determined by the School of Biomedical Informatics. Refer to the standard PhD program application process.

Transfer Credit

Transfer credit for courses taken at other universities or institutions, submitted to meet part of the degree requirements, may be awarded following review and written approval by the student's faculty academic advisor and the Associate Dean for Academic Affairs. The maximum number of transferable credit hours for the doctoral program is 36 semester credit hours.

Credit for courses taken at other universities or institutions that are offered at SBMI are granted only through Petition for Equivalency Credit. Credit for support courses taken at other universities or institutionsis approved by the students' advising committee. Contact the Office of Academic Affairs for more information.

Applicants who are presenting coursework from universities or colleges outside the United States in order to meet graduation requirements should refer to the section on International Applicants for additional requirements.

Financial Assistance

Financial assistance packages and research assistantships will be available to all students on a competitive basis to facilitate full-time doctoral education.

Degree Requirements for the Doctor of Philosophy in Health Informatics

Academic Requirements

A total of 93 semester credit hours listed in the sample curriculum matrix for Health Informatics must be completed prior to graduation. Six of those semester credit hours will be in support courses not offered by the School. The

support courses could include areas such as cognitive science and computer science from Rice University, mathematics from the University of Houston, measurement courses from the University of Texas School of Nursing at Houston, or courses studying healthcare outcomes and biostatistics from the University of Texas School of Public Health at Houston.

A full-time student in the Program in Health Informatics has up to eight years from the time of entry to complete the required coursework. Continuous enrollment is required unless an exception is recommended by advising committee and approved by the Associate Dean for Academic Affairs. A maximum of one year of approved leave will be allowed for continuance in the program. If more than one year occurs, the student must seek readmission to the program.

Each course with an HI prefix in the Health Informatics degree plan is a graduate-level professional course and must be passed with a grade of "B" or better. Only one course grade of "C" is allowed. The minimum GPA required for graduation is 3.0 on all HI courses.

Other Requirements

In Residence Requirement: The term "in residence" refers to the requirement that a student completes 57 semester credit hours over the course of the program at UTHealth. A student must fulfill his or her in residence requirement in order to receive a doctoral degree from the School.

Course of Study for the Doctor of Philosophy in Health Informatics Program

The doctoral degree is a post baccalaureate program. The curriculum of the doctoral degree in Health Informatics includes required didactic courses and preceptorship courses. Didactic courses (lecture/discussion, demonstration and student laboratories) are presented to provide facts, concepts, and theories related to the techniques, and procedures of health informatics. They include instruction in basic informatics, research, advanced informatics and support courses. The preceptorship courses are designed to give students the opportunity to apply theory and techniques in the hospital, research, or private laboratory setting.

Each student will develop his or her curriculum with approval of the advising committee. A degree plan will be filed with the approval of the advising committee that includes a minimum of:

- 6 semester credit hours in foundational courses
- 9 semester credit hours in basic informatics,
- 12 semester credit hours in research,
- 9 semester credit hours in advanced courses,
- 6 semester credit hours in support courses,
- 9 semester credit hours in preceptorship courses,
- 21 semester credit hours in a specific research area approved by the mentor,
- 3 semester credit hours of research seminar, and
- 9 semester credit hours of dissertation.

Changes to the degree plan must have the written approval of the advising committee. The advising committee must approve all courses as part of the degree plan.

Advance to Candidacy

The student must have completed 36 semester credit hours before taking the exam. The exam must be completed before the student takes more than 58 semester credit hours. The candidacy exam will consist of a written and oral presentation of the student's proposed research topic. The student will submit the written proposal to all Health Informatics faculty at least 10 working days prior to the oral presentation. The oral presentation will be open to all students, faculty, adjunct faculty, and interested parties. The exam must be completed at the 58 hour limit or a defense will be scheduled the morning of the posters session of the semester in which the student earned the 58th hour.

All faculty present at the oral presentation cast a vote to pass or fail the student. A student passes if the majority of the faculty present vote to pass and the student's mentor votes to pass. The student's mentor is included in the number of faculty present when calculating the number of votes needed to achieve a majority. If the student passes, he or she is admitted to candidacy. If the student fails, the faculty can recommend failure without another attempt or failure with the opportunity to re-defend within 30 days. If the student again fails the exam, he or she will be given the option of completing a Master of Science in Health Informatics degree, but will otherwise be dismissed from the doctoral program.

Advanced Preceptorship

Advanced Preceptorship is required for all PhD students. During Advanced Preceptorship you will develop and prepare your Advance to Candidacy Proposal including: defining your proposed research agenda; a review of the literature; research design, procedure and data analysis; collecting preliminary data; and scientific contribution to the discipline. The student's faculty academic advisor and advising committee must approve the focus of the research. See the SBMI Student Handbook for further details.

Research in Health Informatics

The research in Health Informatics will be based upon the proposal that the student submitted for the advance to candidacy exam. The student will obtain a clear understanding of the domain of knowledge and research methods needed to complete the dissertation research. The student will use this time to develop a unique research focus under the guidance of the academic advisor.

Dissertation

The faculty believes that communication and dissemination is a critical aspect of the research process. The student will have two options available for the dissertation. The first option will consist of three articles that are accepted for publication. Publication must be in journals or proceedings, which are both, peer reviewed and indexed for academic retrieval. The three papers are combined with an introduction and summary and bound as a dissertation. The second option requires the student to write a monograph or dissertation. The monograph will review the literature, research approaches and options, the data design and gathering processes. The findings and data will be discussed in the context of the published literature. The monograph will be bound.

The dissertation must be presented at an oral defense that is open to the public. All research papers, theses, and dissertations authored by degree candidates are available to interested members of the general public upon request. After the presentation, the students' advising committee votes to pass or fail the student. If the student passes and all degree requirements have been met, the advising committee makes its recommendation to the Associate Dean for Academic Affairs whether to award the degree.

Program	Required Semester Credit Hours
Doctorate in Health Informatics (PhD)	93
Master's in Public Health (MPH)	45
Total Semester Credits	**138**
Shared Courses	-16
GRAND TOTAL FOR COMBINED DEGREES	**122**

Sample Curriculum: Full-Time MPH / PhD Student

Course No. Course Title	Semester Credits
Fall Semester	
HI 5310 Foundations of Health Information Sciences I	3
HI 5380 Principles and Foundations of Public Health Informatics	3
PH 1110 Social and Behavioral Aspects of Community Health (shared course)	3
	Total 9
Spring Semester	
PH 1690 Introduction to Biostatistics (shared course)	4
HI 5311 Foundations of Health Information Sciences II	3
	Total 7
Summer Semester	
HI 5352 Statistical Methods in Health Informatics	3
	Total 3
Fall Semester	
HI 5312 Foundations of Health Information Sciences III	3
Support Course 1	3
	Total 6
Spring Semester	
HI 7000 Preceptorship in Health Informatics	3
HI 7301 Grant Writing	3
	Total 6
Summer	
HI 6301 Health Data Display	3
	Total 3
Fall Semester	
HI 7000 Preceptorship in Health Informatics	6
Support Course 2	3
	Total 9
Advance to Candidacy Exam	
Spring Semester	
HI 7050 Research in Health Informatics	6
	Total 6

HI 6002 Directed Studies   3

                                                                                               Total 9

Summer

HI 7050 Research in Health Informatics   3
HI 6309 Healthcare Interface Design   3
                                                                                               Total 6

Fall Semester

HI 7050 Research in Health Informatics   6
HI 7150 Research Seminar   1
PH 9997 Practicum   3
                                                                                              Total 10

Spring Semester

HI7050 Research in Health Informatics   6
                                                                                               Total 6

 Summer

HI 9999 Dissertation   3
HI 6312 Project Management in Healthcare   3
                                                                                               Total 6

Fall Semester

HI 9999 Dissertation   3
HI 7150 Research Seminar   1
HI 6001 Special Topics   3
                                                                                               Total 7

Spring Semester

HI 9999 Dissertation   3
HI 7150 Research Seminar   1
PH 9998 Written Paper   3
                                                                                               Total 7

                                                                                       Grand Total 94

Application Information for Health Informatics Degree

Applications are accessible at http://registrar.uth.tmc.edu. If further assistance is needed contact:

> Office of the Registrar
> The University of Texas Health Science Center at Houston
> 7000 Fannin, Suite 2250
> Houston, Texas 77030
> Telephone: (713) 500-3388
> Email address: registrar@uth.tmc.edu

For Public Health Informatics, contact:

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Course Descriptions

(Course descriptions are not intended as an assurance or warranty of achievement of specific skills or knowledge.)

HI 5001 Special Topics in Health Informatics
3 semester credit hours

Prerequisite: Consent of instructor

This course provides a timely way to examine cutting edge topics of interest to students and faculty. The varying content may include topics such as: technical writing in Health Informatics comparing knowledge use across disciplines, computational knowledge methods in Health Informatics for example. This course may be repeated as topics vary.

HI 5002 Directed Study in Health Informatics (Variable hours/week)
1-9 semester credit hours

Prerequisite: Consent of instructor

This course provides a mechanism for students to explore issues of personal interest in the field of Health Informatics. The varying content may include topics such as: display of large scale nursing data, mapping issues for dentistry, linking public health knowledge to clinical medicine. This course may be graded on a letter grade or pass/fail basis and may be repeated as topics vary.

HI 5004 Introduction to Clinical Healthcare (2 hours lecture/3 hours ' laboratory/week lecture/demonstration/discussion)
3 semester credit hours/meets part of the basic informatics competencies

Prerequisites: Consent of instructor

The course is designed to provide an overview of the US healthcare system for a) students without any healthcare background and b) students with a healthcare background in a foreign country. It deals with the components of providing care, such as patients, different levels of healthcare providers, locations of care and special populations/circumstances. Financing, regulation and reform of healthcare are also discussed. Current topics of interest, for example translational research and the role of health information technology in healthcare reform, may be included. Students will review a webinar on a topic, participate in Q/A, complete field activities, and write reports for discussion as a class the following week.

HI 5007 Data Structures and Algorithms in Biomedicine (web-based instruction)
3 Semester Credits/meets part of the research informatics competencies

Prerequisites: Consent of instructor

The course is a one-semester graduate level course that examines the process of using an object-oriented programming (OOP) language to building computer applications in support of health care and/or life science practice or research. Students learn modern principles of program design and implementation that enable rapid application development through reusable code modules. Students are exposed to fundamental data structures used to implement algorithms as computer programs. The course examines the structure of well-known algorithms, paying

careful attention to differentiate between algorithms and programs that implement algorithms. A brief overview of the analysis of algorithms for computability is undertaken. Students develop applications of limited scope to implement algorithms in support of health care or life science processes that arise from practice and/or research. The applications will illustrate the OOP principles of encapsulation, inheritance, and polymorphism. Python (2.4.3) is the current course programming language, chosen because of its prevalence of use in the bioinformatics community and because it is open source software.

HI 5300 Introduction to Health Informatics (web-based instruction)
3 semester credit hours/meets part of basic informatics component

Prerequisites: Consent of instructor

This introductory graduate level course covers the discipline of informatics in health care delivery and is designed to be multi-disciplinary in nature. The course will focus on the clinical aspects of information technology and provides a broad overview to the nature of information technology, focusing on hardware, software and conceptual models of information. Students will explore different data types and data models, which are specific to their discipline and those, which can be shared across disciplines. The focus will be on comparing and contrasting the data types and data models of the different disciplines.

HI 5301 Information Systems in the Delivery of Health Care (2 hours lecture/3 hours laboratory/week lecture/demonstration/discussion)
3 semester credit hours/meets part of basic informatics component

Prerequisites: Consent of instructor

This course will focus on the design, implementation and components of Health Care Information Systems. The course will include a history of Health Care Information Systems. This will examine the changing uses and expectations of Health Care Information Systems and the expected usage of Health Care Information Systems at each level of development. The course will explore new options in technology and design, which will allow for the clinically driven Information Systems of the future. The needs of multiple disciplines will be explored to understand how they can share and communicate patient information using Information Systems.

HI 5302 Cognitive Science in Health Informatics (2 hours lecture/3 hours laboratory/week lecture/demonstration/discussion)
3 semester credit hours/meets part of basic informatics component

Prerequisites: Consent of instructor

This course is an introduction to cognitive science--the interdisciplinary study of mind and behavior from an information processing perspective--and its application to health informatics. The course begins with a basic introduction to human cognition and information processing (both symbolic and connectionist),then presents a broad survey of the health informatics areas to which cognitive science has been applied. These areas include health problem solving and education, decision support systems, user-centered interfaces, and the design and use of controlled medical terminologies.

HI 5303 Decision Making in Health Care (2 hours lecture/3 hours laboratory/week lecture/demonstration/discussion)
3 semester credit hours/meets part of basic informatics component

Prerequisites: Consent of instructor

This course will survey the methods of decision-making as applied to health care situations. The course will focus on the major theories of decision-making. In addition to the theories, techniques for the application of the theories will be presented. Decision-making will be discussed in terms of data, which is necessary for informed decision-making and the types of data structures necessary. The relationship between decision-making and the development of Health Care Information Systems will be investigated. The course will investigate some of the legal and ethical aspects of decision-making, related to the decision making by health professionals and the decision making of clients.

HI 5304 Advanced Database Concepts in Health Informatics (2 hours lectures/3 hours laboratory/week lecture/demonstration/discussion)
3 semester credit hours/meets part of research informatics component

Prerequisites: HI 5007 and consent of instructor

In this course, students will use both relational and object-oriented databases to model aspects of health care delivery. Working in teams, students will analyze a practical problem related to a clinical health care situation and model the necessary information into a data model. Development of the data model will include the use of CASE tools. The data model then will be discussed with health professionals in clinical practice for relevance and accuracy. The feedback from the clinical area will be used to revise both models and to evaluate the development process.

HI 5305 Legal Ethical Aspects of Health Informatics (2 hours lecture/3 hours laboratory/week lecture/discussion)
3 semester credit hours/meets part of basic informatics component

Prerequisites: Consent of instructor

Health Informatics involves rapidly changing technology, which impacts the way in which legal and ethical considerations are understood in our culture. This course will examine the relationships between law and ethics. Particular considerations will be given to the concepts of privacy, autonomy, responsibility and decision-making. These concepts will be discussed from both legal and ethical perspectives. The impact of current and future technology will be discussed as it relates to these concepts and the impact on Health Informatics.

HI 5306 Health Information System Security (web-based instruction)
3 semester credit hours/meets part of basic informatics component

Prerequisites: Consent of instructor

This course will address security issues as they impact health information systems. Physical security of the hardware and software including redundancy, back up and restricted access will be discussed. Security and appropriateness of access will be addressed in terms of both hardware and software solutions. Data integrity, audit ability and system integrity will be considered along with the unique problems, which result from network access. Solutions to these concerns will be discussed in terms of industry standards, those, which already exist, and those, which are still evolving.

HI 5307 Systems Analysis for Health Informatics (web-based instruction)
3 semester credit hours/meets part of basic informatics component

Prerequisites: Consent of instructor

The purpose of this course is to assist the student in understanding the components, process and tools used in the necessary components of a health information system. The course will focus on the variety of approaches and tools available for systems analysis. Students will have experience with modeling tools and rapid prototyping tools.

HI 5310 Foundations of Health Information Sciences I (web-based instruction)
3 semester credit hours/meets part of foundations component

Prerequisites: Consent of instructor

This course provides an overview of topics, concepts, theories and methods that form the foundations of health information sciences. It gives students the fundamental knowledge and skills to pursue further study in health informatics. Foundations I presents a general framework for health information science as the construction and use of symbolic, mathematical, and computational models for solving problems throughout the range of biomedical science, from genetics, to clinical care, to public health. It covers concepts, theories and methods that deal with how biomedical information is acquired, discovered, represented, managed, organized, communicated, retrieved, and processed. It also provides an overview of the primary research and application areas in health information science.

HI 5311 Foundations of Health Information Sciences II (2 hours lecture/3 hours laboratory/week lecture/demonstration/discussion)
3 semester credit hours/meets part of foundations component

Prerequisites: HI 5310 and consent of instructor

This course provides an overview of theories and methods that are broadly applicable to all health informaticians. It gives students the theoretical and methodological background needed to pursue study in Health Informatics. The course begins with theories of information from computational, philosophical, mathematical, logical, and biomedical perspectives.

HI 5313 Introduction to Electronic Health Records (web-based instruction)
3 semester credit hours/meets part of basic informatics component

Prerequisites: Consent of instructor

This course is designed to provide informatics students with an overview of the key concepts regarding implementation of a clinically-oriented information system (e.g., an electronic medical record, computer-based provider order entry). The course will examine how health data are collected, how they are used and the impact of electronic records on the health data. The course will review standards, standards development, languages used, and issues related to information processing I healthcare. The course will review the impact of electronic records on health and healthcare including, legal, financial and clinical design issues

HI 5314 Technology Assessment in Healthcare (web-based instruction)
3 semester credit hours/meets part of basic informatics component

Prerequisites: Basic statistics knowledge, HI 5315, HI 5303, HI 6311, and consent of instructor

This course will focus on methods and processes to evaluate positive and negative impacts of various techniques, technologies and interventions in healthcare. The focus will be standard approaches for measuring various outcomes, and development and evaluation of technology assessment models. The course will also focus on merging multiple measures outcomes measurement to conduct unified approach to evaluate effectiveness of planned / implemented technologies, or to compare different options. Finally, the course will try to explore tool/software for the technology assessment.

In this course, "Technology in Healthcare" will be used in a very broad sense, encompassing all interventions, equipment, treatment, etc., that are used in the health care field to care for consumers.

HI 5315 Quality and Outcome Improvement in Healthcare (web-based instruction)
3 semester credit hours/meets part of basic informatics component

Prerequisites: Basic statistics knowledge and consent of instructor

This graduate level introductory course provides an overview to healthcare quality from the view of information science and the discipline of informatics. It takes a patient centered approach that covers the complexities of quality and the scientific basis for understanding the measurement and improvement of quality, considers the macro- and micro- levels of systems involved in quality measurement and improvement, as well as the organizational environments that are used to deliver care. It provides the learner with a framework for key theories and concepts, and models of quality improvement.

HI 5316 Emerging Technologies for Teaching, Learning, and Research (2 hours lecture/3 hours laboratory/week lecture/demonstration/discussion)
3 semester credit hours/meets part of basic informatics component

Prerequisites: HI 5340 and consent of instructor

Participants in this course will use emerging technologies to address challenges in teaching, learning and research. The focus is on using theory to drive the incorporation of technology for educators, informaticists and researchers. Participants will combine theories, selected technologies, appropriate pedagogy, instructional design and usability. The process will follow a model developed by the instructors to apply emerging technologies to solve problems.

HI 5340 Introduction to Learning Environments in the Health Sciences (web-based instruction)
3 semester credit hours/meets part of the basic informatics component

Prerequisites: Consent of instructor

This course will provide an overview of learning research from the fields of cognitive science, education, psychology and neuroscience, and how this information can be applied to develop learning environments for the health sciences using current and emerging technologies. The focus of the course will be on the process of applying learning theory and pedagogy to produce targeted learning environments for populations in the health sciences, which may include health professionals, technicians/staff, the general public or patients. Following completion of the course, students will have the opportunity to obtain knowledge and resources to begin designing learning environments that are based on scientific, instructional, and technological research findings.

HI 5341 Learning Environment Development in the Health Sciences (web-based instruction)
3 semester credit hours/meets part of the research informatics component

Prerequisites: HI 5340 and consent of instructor

In this course students will be responsible for choosing a health sciences content area around which to build a novel learning environment. Students will work in teams to design, develop, and create a novel learning environment, employing expertise and resources in the UTHealth and greater Houston community. The course grading and objectives focus on the group project, its design development, and the design and planning of the learning environment evaluation. Students will have the opportunity to obtain hands-on experience in creating learning environments, including the problem solving skills to be successful at this type of interdisciplinary project.

HI 5350 Evaluation of Health Care Systems (web-based instruction)
3 semester credit hours/meets part of research informatics component

Prerequisites: Consent of instructor

This multi-disciplinary course will focus on the process of evaluating and choosing a health information system. The course will assist the student in identifying the critical needs that the health information system is to address. Different methods of evaluation will be presented and discussed in terms of how they would apply to health information systems. The evaluation process will begin with identifying the needs of the organization, and presenting them in an organized manner so the vendors can address the needs followed by mechanisms for evaluation.

HI 5351 Research Design and Evaluation in Health Informatics (2 hours lecture/3 hours laboratory/week lecture/demonstration/discussion/laboratory)
3 semester credit hours/meets part of research informatics component

Prerequisites: Consent of instructor

This course provides the student the opportunity to develop more advanced competencies in the design, analysis, interpretation and critical evaluation of experimental, quasi-experimental, pre-experimental and qualitative health informatics research and evaluation studies. The student will identify flaws or weaknesses in research and evaluation designs, choose which of several designs most appropriately tests a stated hypothesis or controls variables potentially jeopardizing validity, and analyze and interpret research and evaluation results. Through exposure to the basic 'building block' designs, students will have the opportunity to develop the competence to appropriately choose and to use the most important and frequently used design procedures for single or multifactor research or evaluation studies.

HI 5352 Statistical Methods in Health Informatics (2 hours lecture/3 hours' laboratory/week lecture/ demonstration/discussion/laboratory)
3 semester credit hours/meets part of research informatics component

Prerequisites: Consent of instructor

This course provides the student the opportunity to develop basic competencies in the measurement, design, analysis, interpretation and critical evaluation of health information research and evaluation studies. Students will have the opportunity to learn and apply the most important and most frequently used statistical measures and methods, as well as to critically evaluate their appropriate use in health informatics research and evaluation. Topics include the study of frequency distributions, measures of central tendency, variance, hypothesis testing, correlation and both parametric and non-parametric inferential methods including t-tests, analysis of variance, chi-square tests of significance, and tests of measures of association.

HI 5353 Health Informatics Data Analysis (2 hours lecture/3 hours laboratory/week lecture/demonstration/discussion)
3 semester credit hours/meets part of research informatics component

Prerequisites: Consent of instructor

This course provides the student the opportunity to know when and how to use state of the art data analysis computer software to perform each of a comprehensive set of the most important and frequently used data analysis techniques for research and evaluation in health informatics. The student will choose the most appropriate data analysis tools, to perform qualitative, descriptive, inferential, parametric, non-parametric, multifactor and multivariate techniques as well as graphical data modeling analytic techniques using the computer. Qualitative data analysis and related software will demonstrate alternate methods for data collection and reduction.

HI 5354 Cognitive Engineering in Health Informatics (2 hours lecture/3 hours laboratory/week lecture/demonstration/discussion)
3 semester credit hours/meets part of research informatics component

Prerequisites: HI 5302 and consent of instructor

This course focuses on cognitive engineering techniques for designing user-centered health information systems. Such systems provide appropriate functionality to the user, are easy to use and learn, reduce the chance of user error, and increase user efficiency. The course emphasizes how human cognitive abilities and limitations impose requirements on the design of effective interfaces. It covers the theory and practical application of several cognitive engineering techniques, including cognitive task analysis, verbal protocol analysis, propositional analysis, and cognitive walkthroughs

HI 5380 Principles and Foundations of Public Health Informatics (2 hours lecture/3 hours laboratory/week lecture/demonstration/discussion)
3 semester credit hours/meets part of the basic informatics component

Prerequisites: Consent of instructor

This course will introduce foundation knowledge of Public Health Informatics. In this course students will explore how information sciences and computer sciences can be applied to enhance public health practice, research and education. Content will include current standards, databases, networks, information systems and technologies applied to public health. In addition, this course will cover national and regional initiative and legal aspect of public health informatics. Students will gain hands-on experience by involvement in team projects. The projects will explore a specific problem domain seeking to critically analyze and propose practical solutions.

HI 5381 Methods in Public Health Informatics (2 hours lecture/3 hours laboratory/week lecture/demonstration/discussion)
3-semester credit hours/meets part of the basic informatics component

Prerequisites: Consent of instructor

This course introduces practical methods and techniques used in Public Health Informatics (PHI). The course will focus on methods for evaluation of the effectiveness and efficiency of public health protection and delivery. The course modules are organized into three domain knowledge of PHI methods: 1) *Legal and Policy Framework of Public Health Informatics,* 2) *GIS and Spatial Analysis,* and 3) *Evaluation and Knowledge Management of Public*

Health Informatics. The course is designed to familiarize students with methods for addressing the core concepts and issues confronting public health practitioners and researchers in planning, implementation and evaluation of information systems.

HI 5382 Synthesis Project of Public Health Informatics
(2 hours lecture/3 hours laboratory/week lecture/demonstration/discussion)
3 semester credit hours/meets part of the basic informatics component

Prerequisites: Consent of instructor

The Public Health Informatics Synthesis Course provides an opportunity for students to practical, hands-on cumulating knowledge and experiences in Public Health Informatics. This project should reflect a substantial effort and competency of synthesis in informatics developed through the course training that address core competencies of public health informatics system by working through the problem of the student's choice. The selected problem should be discussed and approved by a faculty mentor. This should be tied to research/practice of a student's interest that includes one or more didactic modules covered in the prior courses. The synthesis project should be based upon the combined efforts of (online) library database search, fieldwork, and mentored research approved by mentor(s). Expectations of the class should include the presentation of the conclusions from the project in a written manner for academic dissemination as a conference abstract, poster

HI 6000 Practicum in Health Informatics (Variable hours/week)
1-6 semester credit hours

Prerequisites: Consent of instructor

During the practicum, each student will select an area of interest in which to apply the knowledge and skill gained during the didactic courses. Students will become active participants in the work of developing informatics-based applications. Each student will develop a specific set of goals to be accomplished. The student's advising committee and practicum supervisor must accept these goals. These goals will reflect the student's area of interest and the needs of the organization. This course is graded on a pass/fail basis and is repeated for a maximum of six semester credit hours to meet degree requirements.

HI 6001 Special Topics in Health Informatics
3 semester credit hours

Prerequisite: Consent of instructor

This course provides a timely way to examine cutting edge topics of interest to students and faculty. The varying content may include topics such as: technical writing in health informatics comparing knowledge use across disciplines, computational knowledge methods in health informatics. May be repeated as topics vary.

HI 6002 Directed Study in Health Informatics (Variable hours/week)
1-9 semester credit hours/meets part of advanced informatics component

Prerequisite: Consent of instructor

This course provides a mechanism for students to explore issues of personal interest in the field of Health Informatics. The varying content may include topics such as: display of large scale nursing data, mapping issues for

dentistry, linking public health knowledge to clinical medicine. This course may be graded on a letter grade or pass/fail basis, and may be repeated as topics vary.

HI 6300 Advanced Health Information Systems(2 hours lecture/3 hours laboratory/week lecture/demonstration/ discussion)
3 semester credit hours/meets part of advanced informatics component

Prerequisites: HI 5301 and consent of instructor

This course will examine advanced concepts in health informatics systems, including mechanisms for linking current information systems with legacy systems, network based information systems, community health information systems (CHINs) and communication among disparate information systems. Topics will include identifiers; electronic data interchange systems and new models of information systems. Emphasis will be given to issues of how computational knowledge techniques affect the kind and type of knowledge displayed. Automation of knowledge reorganization as it is transferred among disciplines and settings will be discussed.

HI 6301 Health Data Display (web-based instruction)
3 semester credit hours/meets part of advanced informatics component

Prerequisites: Consent of instructor

This course will examine the evaluation and design of information displays for healthcare. The course will focus on three areas: (1) theories and methodologies for the evaluation of information displays, (2) techniques and tools for generating effective information displays through visualization, and (3) how the formats of information displays affect decision making in healthcare.

HI 6302 Knowledge Modeling and Engineering in Health Informatics (2 hours lecture/ 3 hours' laboratory/ week lecture/ demonstration/discussion/laboratory)
3 semester credit hours/meets part of advanced informatics component

Prerequisites: Consent of instructor

This course first covers in depth the methods and techniques for knowledge modeling and engineering in healthcare. This includes an introduction on how to conduct a task analysis, and how to collect and analyze domain knowledge gathered from reference sources or expert behavior. The course will cover how these methods and techniques are used to construct health informatics systems that are more robust, more helpful, and easier to use than systems engineered without these techniques. Also covered are various techniques for evaluating the accuracy and effectiveness of the constructed systems from experimental data. The students also have an opportunity to engineer knowledge models using connectionist representations. Throughout the course, emphasis is placed on how knowledge engineering is used to design decision support tools, tutoring systems, and educational improvements for health informatics. In the second part of the course, students are given a knowledge engineering task in a healthcare area for which they must develop a knowledge model and then construct and evaluate a knowledge-based system.

HI 6303 Introduction to Telehealth (2 hours lecture/3 hours laboratory/week lecture/demonstration/discussion)
3 semester credit hours/meets part of advanced informatics component

Prerequisites: Consent of instructor

The course will provide an overview of tele-health in the context of the general health care system. It will survey the application of tele-health in various medical specialties and different settings, e.g., rural, military/aerospace and corrections. The course will identify key issues in implementing and operating a telehealth program including technology, economics, law/ethics, training, protocol development, and evaluation.

HI 6304 Consultation in Health Informatics (2 hours lecture/3 hours laboratory/week lecture/demonstration/discussion)
3 semester credit hours/meets part of advanced informatics component

Prerequisites: Consent of instructor

Health Informatics requires that practitioner's work closely with others in developing health informatics based interventions. The interventions can include determining the nature and type of system that needs to be developed, an understanding of what is involved in the delivery of care and understanding the social and political aspects of change within an organization. This course will describe the nature of the consultation role and explore the options and strategies available to consultant that can make the consultant role more efficient.

HI 6305 Social Dynamics and Health Information (web-based instruction)
3 semester credit hours/meets part of advanced informatics component

Prerequisites: Consent of instructor

The implementation of information systems will not only greatly enhance the quality of healthcare but also radically change the nature of healthcare. This course will look at healthcare as a distributed system composed of groups of people interacting with each other and with information technology. Two major areas will be covered in the course. The first area is computer-supported cooperative work (CSCW), which is defined as computer-assisted coordinated activity such as reasoning, problem solving, decision-making, routine tasks, and communication carried out by a group of collaborating individuals who interact with complex information technology. Most health information systems (such as EMR) are large groupwares that support large numbers of synchronous and asynchronous users with diverse background in the executions of many different types of tasks. The second area is the social impact of information technology. This area will focus on the impact of Internet on healthcare, such as the functions and impacts of virtual communities, online health groups, and tele-healthcare through the web.

HI 6306 Information and Knowledge Representation in Health Informatics (2 hours lecture/3 hours laboratory/week lecture/ demonstration/discussion)
3 semester credit hours/meets part of advanced informatics component

Prerequisites: Consent of instructor

The purpose of this course is to examine the role of information representation, controlled vocabularies and knowledge engineering constructs such as ontologies in conceptualization, design and implementation of modern health information systems. The course will introduce approaches for representing information and knowledge in a distributed network of health information systems. Moving beyond a general understanding of taxonomies, students will gain an understanding of the conceptual foundations of ontologies including the limitations of the modern systems. Knowledge modeling and engineering principals will be introduced through lectures, hands on practice and the class project. This will include the design, construction and use of ontologies in health care applications. Through hands on experience, students will gain insight into the strengths and limitations of the existing resources, approaches and systems as well as point to directions where future work needs to be done.

HI 6308 Consumer Informatics (2 hours lecture/ 3 hours laboratory/ week lecture/ demonstration/ discussion)
3 semester credit hours/meets part of advanced informatics component

Prerequisites: Consent of instructor

Current technology is giving the consumer greater access to health information than at any time in the past. Information is available from federal agencies, volunteer organizations, consumer services and direct consumer-to-consumer communications. The availability of information with varying degrees of quality is changing the way consumers think about their own health as well as changing the relationship between consumers and providers. Students will explore the impact of this technology, consider the directions which the current technology might head and explore the potentials of future technology on the delivery of healthcare. This is a research course and students will be required to complete a research project that contributes to a broader understanding of consumer health informatics.

HI 6309 Healthcare Interface Design (2 hours lecture/ 3 hours' laboratory/ week lecture/ demonstration/discussion)
3 semester credit hours /meets part of advanced informatics component

Prerequisites: Consent of instructor

This course covers topics of user interface design for health information systems, medical devices, consumer health web sites, and other healthcare related systems. Students will have the opportunity to learn the fundamental principles of human-computer interaction and human factors and learn how to apply them to real world problems through class projects. The focus is on learning why user-friendly interfaces can greatly improve work productivity and enhance the quality of healthcare without radically changing the underlying technology.

HI 6311 Advanced Decision Analysis (2 hours lecture/3 hours laboratory/week lecture/demonstration/ discussion)
3 semester credit hours /meets part of advanced informatics component

Prerequisites: Consent of instructor

This course will focus on decisions made with high degrees of uncertainty. The focus will be on modeling the decisions and the types of uncertainty that are present in the decision making process. The focus will be on developing ways to reduce the amount and types of uncertainty while still maintaining the key elements of the decision making process. In addition, the course will focus on ways to automate the decision making process in terms of the way in which data, information and knowledge is aggregated, the modeling of the decision data against existing standards or protocols, and presenting alternative display approaches to the understanding of the data, information and knowledge employed in the decision making process.

HI 6312 Project Management in Healthcare (web-based instruction)
3 semester credit hours /meets part of the advanced informatics component

Prerequisites: Consent of instructor

This is an introduction to project management structured for students who have begun to run their own projects, and is project based to develop managers for large healthcare projects. These projects can include a system implementation, evaluation of an existing system, or other large project.

HI 6313 Scientific Writing in Healthcare (2 hours lecture/ 3 hours laboratory/ week lecture/ demonstration/ discussion)

3 semester credit hours/meets part of research informatics component

Prerequisites: Consent of instructor

This course provides the advanced skills necessary to write a full range of scientific manuscripts in health informatics. The course begins with the philosophy of science, types of scientific research, and types of scientific manuscripts (including review, applied, and research articles). The course then examines each component of a scientific manuscript in detail, including the title, abstract, introduction, literature review, method, discussion, conclusion, and appendices. The course covers the purpose of each of these components, discusses properties that distinguish good components from bad, and presents techniques for producing high quality scientific writing. Students will apply these techniques by examining selected published papers, producing their own scientific writing, and critiquing the writing of others in the class. Students are expected to enter the class with a draft scientific paper that they have written and a high degree of general writing skill.

HI 6314 Knowledge Acquisition
(2 hours lecture/ 3 hours laboratory/ week lecture/ demonstration/ discussion)
3 semester credit hours/ meets part of advanced informatics component

Prerequisites: HI 6302 and consent of instructor

This course will focus on an understanding of the different forms of knowledge used in biomedical informatics. Based on the type of knowledge, where the knowledge is located and how the knowledge is structured, the course will examine different methods to acquire that knowledge from the people and/or repositories that contain the knowledge. The course will examine strategies to validate that knowledge and to create a repository for that knowledge. A more detailed understanding of the repository can be found in HI 6302 Knowledge Modeling I.

HI 6315 Advanced Electronic Health Records (2 hours lecture/3 hours laboratory/week lecture/demonstration/discussion)
3 semester credit hours/meets part of advanced informatics component

Prerequisites: HI 5313 and consent of instructor

This course is designed to provide informatics students with an in-depth overview of the key concepts regarding implementation of a clinically-oriented information system (e.g., an electronic medical record, computer-based provider order entry, nursing 5). The course will strive to present "best practices" in cases in which there is evidence to support such assertions. The course will rely heavily upon the published literature as well as the experience of the instructors.

HI 6323 Datamining in Biomedical informatics (2 hours lecture/3 hours laboratory/week lecture/demonstration/discussion)
3 semester credit hours /meets part of the advanced informatics component

Prerequisites: Consent of instructor

Recent advances in genomic technologies, especially the microarray/gene chips technology enable biologists to generate large amount of complex data. To explore the meaning of the data, one needs sophisticated data mining algorithms and tools. This course is intended to explore different problems and methods in bioinformatics with focus on the computational and datamining methods for complex data such as microarray data. A set of basic

computational methods and models for analyzing genomic and structural biological data from high throughput technologies will be introduced. Students will be required to complete mini projects on some of the methods.

HI 6351 Triangulation Methods in Biomedical Informatics (2 hours lecture/ 3 hours laboratory/ week lecture/ demonstration/ discussion)
3 semester credit hours /meets part of research informatics component

Prerequisites: Consent of instructor

This course will combine quantitative and qualitative methods into an integrated research approach. Much of the innovative research in Health Informatics requires that students be involved in the design and measurement of studies where reliable and valid measures do not exist for all concepts and constructs. Both methodological approaches can be combined to give insights that would not be possible from either method alone. The course will explore the methodological assumptions, the applications and the software that can support triangulation methods.

HI 7000 Advanced Preceptorship (Variable hours /week)
1-9 semester credit hours
Required for doctoral students

Prerequisites: Admission to the doctoral program

The student will use this course to develop a pilot study to design the instrument that will be used in the data collection for the dissertation. The student must complete nine semester credit hours with the supervision of the mentor or primary advisor. The study with the data will be used to prepare the advance to candidacy proposal.

HI 7050 Research in Health Informatics (Variable hours/week)
1-21 semester credit hours
Required for doctoral students

Prerequisites: Advanced to candidacy exam successfully completed

The doctoral candidate must complete 21 hours of research in health informatics. The mentor or primary advisor will supervise the advancement of the candidate's progress.

HI 7100 Career Development in Health Informatics (1-hour lecture/discussion)
1 semester credit hour
Required for post-doctoral students

Post-Doctoral Students will explore various mechanisms and processes that will enhance their development to become a faculty member at an institution of higher education. The topics will include but not limited to: salary negotiation, startup package negotiation, grant preparation, promotion and tenure expectations, and publication expectations. This course is required for the Post-Doctoral Certificate program.

HI 7150 Research Seminar (1 hour lecture/demonstration/discussion)
1 semester credit hour
Required for doctoral students, May be repeated for 3 hours to meet the degree requirement.

HI 7200 Supervised Research (2 hour discussion)
2 semester credit hours

Required for post-doctoral students

Post-Doctoral students will work with their mentor to learn the process of managing and conducting a research project. This may include project management skills, proposal writing, and specific professional or scientific skills needed for a particular research project. This course is required for the Post-Doctoral Certificate program. This course may be repeated each semester that the post doctoral student is in the certificate program.

HI 7301 Grant Writing (2 hours lecture/ 3 hours laboratory/ week lecture/ demonstration/ discussion)
3 semester credit hours /meets part of research informatics component
Required for doctoral students

Prerequisites: Consent of instructor

Students will develop skills in the planning and execution of grant development. The focus will be on NIH and NSF grants forms, but students will also be exposed to grant applications from private organizations. The focus of the course will be for students to develop a draft that can be used for the funding of dissertation work, or to develop a grant that would allow students to continue their dissertation work in a post-dissertation award. Students will learn how to write the narrative, project time lines, include appropriate evaluation and draft budgets.

HI 9999 Dissertation in Health Informatics (Variable hours)
1-9 semester credit hours
Required for doctoral students, May be repeated for 9 hours to meet the degree requirement.

The following courses (starting with HIT-) are offered for the Master of Science in Applied Health Informatics program. In general, the course work in the Master of Science in Applied Health Informatics program is not transferable to the Master of Science in Health Informatics or the Doctor of Philosophy in Health Informatics unless the courses are cross-listed or are approved by the student's advisor and the Associate Dean for Academic Affairs.

HIT 5000 Practicum in Applied Health Informatics
(Variable hours/week)
1-3 semester credit hours

Prerequisites: Consent of instructor

Description: During the practicum, each student will select an area of interest in which to apply the knowledge and skill gained during the didactic courses. Students will become active participants in the work of developing informatics-based applications and/or applying informatics science and skills to address an information management need. Each student will develop a specific set of goals to be accomplished. The student's advising committee and practicum supervisor must approve these goals. These goals will reflect the student's area of interest and the needs of the organization. This course is graded on a pass/fail basis and is repeated for a maximum of six semester credit hours to meet degree requirements.

HIT 5001 Special Topics: Applied Health Informatics
(Variable hours/week)
1-3 semester credit hours

Prerequisite: Consent of instructor

This course provides a timely way to examine cutting edge topics of interest to students and faculty. The varying content may include topics such as: technical writing in Health Informatics comparing knowledge use across disciplines, computational knowledge methods in Health Informatics, etc. This course may be repeated as topics vary.

HIT 5002 Directed Study: Applied Health Informatics
(Variable hours/week)
 1-3 semester credit hours

Prerequisite: Consent of instructor

This course provides a mechanism for students to explore issues of personal interest in the field of Health Informatics. The varying content may include topics such as: display of large scale nursing data, mapping issues for dentistry, and linking public health knowledge to clinical medicine. This course may be graded on a letter grade or pass/fail basis and may be repeated as topics vary.

HIT 5300 Introduction to Health Informatics
(web-based instruction)
3 semester credit hours

Prerequisites: Consent of instructor

This introductory graduate level course covers the discipline of informatics in health care delivery and is designed to be multi-disciplinary in nature. The course will focus on the clinical aspects of information technology and provides a broad overview to the nature of information technology, focusing on hardware, software and conceptual models of information. Students will explore different data types and data models specific to their discipline and those that can be shared across disciplines. The focus will be on comparing and contrasting the data types and data models of the different disciplines.

This course is cross-listed with HI 5300.

HIT 5301 The U.S. Healthcare System
(web-based instruction)
3 semester credit hours

Prerequisites: Consent of instructor

This course will present a survey of the modern American health care system. The course will focus on the major pieces of legislation that serve as the foundation of the current US health care structures. Topics in the course will include Medicare, Medicaid, and HIPAA, their impacts on financing, health care access and professional roles. The course will integrate current legislative actions, public concerns, implications, and discussions surrounding healthcare reform.

HIT 5302 Communication in Applied Health Informatics
(web-based instruction)
3 semester credit hours

Prerequisites: Consent of instructor

This course will combine theoretical and practical exploration of communication within healthcare, including standard data (ICD-9-CM, ICD-10-CM, CPT etc), data interchange (HIEs) and other standards for health communication. The course will also examine the communication patterns of physicians, nurses, and other healthcare providers, and the implications of these patterns in the context of information technologies. The course will examine the standard languages that each discipline has adopted, and the informal language that they use when communicating to and about each other. This focus on language will be the entry point to understanding the culture of healthcare and healthcare workers. In addition, students will learn and practice interpersonal communication skills and formal communication skills with the use of PowerPoint etc.

HIT 5303 Safety and Security in Applied Health Informatics
(web-based instruction)
3 semester credit hours

Prerequisites: Consent of instructor

This course will focus on the social and technical aspects of safety and security in healthcare. While there is much public focus on the technical aspects of privacy and security, social practices and behaviors are often the 'weak link' in the security chain. Students will explore the strengths and weaknesses, from both the technical and social aspects, of different password structures, biomorphic identification, and automated security systems. The goal of the course is to find the optimal combination that can be incorporated into the workflow of specific organizations. The rest will be a 'best fit' security solution.

This course is cross-listed with HI 5306.

HIT 5320 Applied Health Information Systems in the Delivery of Healthcare
(web-based instruction)
3 semester credit hours

Prerequisites: Consent of instructor

This course will focus on the design, implementation, and components of health care information systems. The course will include a history of health care information systems. Students will examine the changing uses and expectations of health care information systems and the expected usage of such systems at each level of development. The course will explore new options in technology and design, which will allow for the clinically driven information systems of the future. The needs of multiple clinical disciplines will be explored to understand how they can share and communicate patient information using information systems.

HIT 5322 Systems Analysis in Applied Health Informatics
(web-based instruction)
3 semester credit hours

Prerequisites: Consent of instructor

The purpose of this course is to assist the student in understanding the components, processes and tools used in the necessary components of a health information system. The course will focus on the variety of approaches and tools available for systems analysis. Students will have experience with modeling tools and rapid prototyping tools.

This course is cross-listed with HI 5307.

HIT 5323 Evaluation of Health Information Systems in Applied Health Informatics
(web-based instruction)
3 semester credit hours

Prerequisites: Consent of instructor

This multi-disciplinary course will focus on the process of evaluating and choosing a health information system. The course will assist the student in identifying the critical needs that the health information system is intended to address. Different methods of evaluation will be presented and discussed in terms of how they would apply to health information systems. The evaluation process will begin with identifying the needs of the organization, and presenting them in an organized manner so the vendors can address the needs followed by mechanisms for evaluation.

This course is cross-listed with HI 5350.

HIT 5324 Project Management in Applied Health Informatics
(web-based instruction)
3 semester credit hours

Prerequisites: Consent of instructor

This course is an introduction to project management that is structured for students who have begun to run their own projects. The course is project-based and is designed to develop managers for large healthcare projects, such as a system implementation, evaluation of an existing system, or other large project.

This course is cross-listed with HI 6312.

HIT 5325 Social Dynamics in Applied Health Informatics
(web-based instruction)
3 semester credit hours

Prerequisites: Consent of instructor

This course is based upon the premise that implementation of information systems will not only greatly enhance the quality of healthcare but also radically change the nature of healthcare. The students will examine healthcare as a distributed system composed of groups of people interacting with each other and with information technology. Two major areas will be covered in the course. The first area is computer-supported cooperative work (CSCW), which is defined as computer-assisted coordination of activities such as reasoning, problem solving, decision-making, routine tasks, and communication. CSCW involves a group of collaborating individuals who interact with complex information technology. Most health information systems (such as EHR) are examples of large groupware. Groupware supports large numbers of synchronous and asynchronous users of diverse backgrounds as they execute many different types of tasks. The second area is the social impact of information technology. This area will focus on the impact of Internet, social networking, and similar innovations on healthcare.

This course is cross-listed with HI 5305.

HIT 5326 Assessments in Applied Health Informatics
(web-based instruction)

3 semester credit hours

Prerequisites: Consent of instructor

Students in this course will learn how to identify and assess different aspects of healthcare systems and healthcare workflow. The addition of a comprehensive electronic health record (EHR) is very disruptive to the workflow and organization of a primary care provider. It is suggested that EHR decreases the throughput of a primary care clinic. However, if properly designed, an EHR can improve the quality of the healthcare delivered and increase satisfaction of clinicians and patients. Students will learn the skills needed to assess and help improve workflow and the quality of healthcare delivery.

HIT 5327 Standards and Standards Development in Applied Health Informatics
(web-based instruction)
3 semester credit hours

Prerequisites: Consent of instructor

Unlike much of the world, healthcare standards are frequently developed by private organizations rather than the government. The Standards Development Organizations (SDOs) create an alphabet soup of organizations that are often not well known to people within healthcare, let alone those just entering healthcare. This course will explore the history of a variety of SDOs, examining their membership and focus domain. Students will examine the role of the major SDOs and their impact on the structure and function of healthcare delivery in the US. The relationship between US and International Standards Organizations will be reviewed.

Graduate Faculty

Alemayehu Abebe, PhD, Assistant Professor, School of Biomedical Informatics, UTHealth, PhD, Universität Zürich, 2003.

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Noriaki Aoki, MD, PhD, MS; MBA Assistant Professor, School of Biomedical Informatics, UTHealth. Adjunct Assistant Professor, Division of International Health, Tohoku University School of Medicine, Japan, Adjunct Assistant Professor, Department of Emergency and Critical Care Medicine, Showa University School of Medicine, Japan, President, Center for Health Outcomes Research and Development, Japan. MD, Sapporo Medical University, 1991; PhD, Kyoto University Faculty of Medicine, 2002; MS, The University of Texas School of Health Information Sciences at Houston, 2001, MBA, University of Massachusetts, 2007.

Dr. Aoki is a board certified physician in Internal Medicine and Acute Medicine in Japan, and a fellow member of the American College of Physician (FACP) and the Japanese Society of Internal Medicine (FJSIM). He is also certified Physician Executives (CPE) certified by the American College of Physician Executives. He completed his post-doctoral research in decision science and medical informatics at the Baylor College of Medicine, Houston, Texas. Dr. Aoki has conducted wide-ranging collaborative researches locally, nationally and internationally, which resulted more than 50 peer-reviewed original articles. Dr. Aoki has major interests in clinical data analysis to improve process and outcomes of clinical care, which includes data mining, text mining, decision analysis, cost-effectiveness analysis, geographic information systems, and various simulations. He has also done extensive research in decision making /decision support system, especially in extreme environment, such as disasters, trauma care and terrorism. He has also started projects related to medical management, health communication, knowledge management, and edutainment system development utilizing small handheld devices. Recently, he has been involved in prefecture-level community healthcare planning in Japan. In education, he has developed and deployed interdisciplinary informatics and management education program (Health Informatics and Management Program: HIMAP) in Japan, which is based on a Master's degree program at the University of Texas School of Biomedical Informatics at Houston. The graduates of the HIMAP program now established not-for-profit organization in Japan, called HIMAP, to promote education, research and development in community health care planning and initiated healthcare reform activities funded by Ministries and local governments in Japan.

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Gábor Balázsi, PhD; Adjunct Assistant Professor, School of Biomedical Informatics and the Department of Internal Medicine, UT Medical School, UTHealth. BS, MS, Babeş-Bolyai University of Cluj, Romania 1996 and 1997; and MS, PhD, University of Missouri - St. Louis and Rolla, 1999 and 2001.

Dr. Balázsi is a biological physicist interested in using interdisciplinary approaches to solve fundamental biological problems, such as identifying the causes and consequences of non-genetic heterogeneity in clonal cell populations, developing novel approaches for gene expression control, and understanding the evolution of drug resistance. He is

one of the recipients of the NIH Director's New Innovator Award, which was created to "stimulate highly innovative research and support promising new investigators".

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J. Robert Beck, MD; Adjunct Professor, School of Biomedical Informatics, and Fox Chase Cancer Center. UTHealth. BA, Dartmouth College, 1974; MD, John Hopkins University, 1978; Clinical Fellow in Medicine, New England Medical Center, 1982.

Dr. Beck is an internationally recognized expert in medical decision-making and is editor of the premier journal in that area. Dr. Beck is a founding member of the Fellows of the American College of Medical Informatics.

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Dr. Ross is a Biochemist. She is one the first graduates of the UTHealth Graduate School of Biomedical Sciences. She worked at Hermann Hospital managing the laboratories. In 1973, she came to the School of Allied Health Sciences as

a faculty member in the Department of Clinical Laboratory Sciences. She became Dean Pro Tem in September 1992 as the School was redefining itself. She has been instrumental in the development of the new School of Biomedical Informatics. The School received approval to offer a master's degree in Health Informatics in July of 1999. In October of 2000, the School under her leadership received approval to offer a doctoral degree in Health Informatics. In March2001, the official name of the school was changed to the School of Biomedical Informatics and she was officially named Dean.

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Dr. Mano Selvan serves as pharmacy research scientist for Competitive Health Analytics, Inc (Humana Corporation). She is responsible for data management and analysis throughout a research project's life cycle. Dr. Selvan worked for The University of Texas M. D. Anderson Cancer Center for over eight years where she conducted research and quality improvement studies focused on individual disease-specific risk factors, clinical and pharmacy management programs to enhance patient safety, effectiveness and outcomes. She has also worked at a major hospital system at Houston for about three years as an outcomes researcher focusing on information technology interventions to improve quality of care. She was the principal investigator and co-investigator for several outcomes studies aimed to improve appropriate care standards for diseases and appropriate management of drugs like warfarin and epoetin and darbepoetin by implementing innovative interventions. Much of her work centered around leading projects focusing on understanding disease specific risk factors, evaluation of outcomes of clinical information technology interventions, effective management strategies, pay for performance and evidence-based healthcare projects and their impact on clinical and cost outcomes. Dr. Selvan is an Adjunct Assistant Professor at the University of Texas School Of Biomedical Informatics. She is also a member in the University of Texas - Memorial Hermann Center for Healthcare Quality and Safety. Dr. Selvan has authored and co-authored several scientific abstracts, posters, book chapters and peer-review scientific manuscripts.

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Dr. Shegog is an Assistant Professor of Behavioral Sciences and Health Promotion at the UTHealth School of Public Health Center for Health Promotion and Prevention Research and Associate Director of Communication and Dissemination in the UT Prevention Research Center. His research is devoted to enhancing the effectiveness of health communication by furthering our understanding of how instructional technology can impact health behavior change. The unifying themes of his research are the (1) design of innovative behavioral change software that uniquely operationalize behavioral science theory and methods, (2) implementation of interventions through the novel integration of delivery platforms and media strategies, (3) efficacy and effectiveness of technology-based interventions in impacting behavior change, and (4) dissemination research on technology-based interventions for extended reach to at-risk populations. His teaching and mentoring focuses on training students to understand and apply behavioral theory and models in public health interventions. His local and national service focuses on enhancing innovation in public health research and practice. Research projects have focused on using computer-based education and decision-support programs to enhance the management of pediatric asthma by children, families, and community physicians ('Watch, Discover, Think, then Act'), CD_ROM and internet-based applications for smoking cessation and prevention in child and adolescent populations ('ASPIRE' and 'Headbutt'), computer-based HIV/STD and pregnancy prevention in middle school children ('It's Your Game'), and internet-based violence prevention in high school and college populations ('Peacetest'). Most recent and current projects include the development of an Internet-based HIV, STI, and pregnancy prevention curriculum for middle school children ('It's Your Game-Tech'), clinic-based PDA decision support for epilepsy management ('MINDSET'), and clinic-based self-management skills training for HIV+ youth ('+CLICK').

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Siraj completed his medical degree at the University of Mysore (India) in 2001, and practiced primary care in India before coming to the United States to complete his Master's degree in Health Informatics at the University of Texas School of Biomedical Informatics. Siraj joined Memorial Hermann in April 2006, after obtaining his master's degree. In his time at Memorial Hermann, Siraj has been a key leader in creating improvements in patient safety, quality and operational excellence using clinical decision support tools within Care4. Siraj advanced quickly from a role as a clinical application analyst to becoming the clinical informaticist for CDS. He has facilitated clinical workflow analysis with physicians, nurses, pharmacist, case managers, and quality and performance improvement staff across the organization, and worked within information systems colleagues to discover the advanced capabilities of our applications to best design CDS intervention to improve patient care. Siraj was nominated for System Services "Employee of the Year" in 2010, and was a member of the CDS Oversight Committee team that received the Gold Circle "Breakthrough of the Year" in Quality Award in 2010 as well as the Breakthrough of the Quarter award for

quality and patient safety in 2008. Siraj developed the methodologies and algorithms to determine the number of "Good Catches" from our CDS interventions, medical errors that were prevented within Care4 before reaching a patient and potentially causing an adverse event. Siraj also serves as an adjunct faculty member of the University of Texas School of Biomedical Informatics, where he has taught courses in "Introduction to Electronic Health Records" and "Introduction to Applied Clinical Decision Support." He has published journal articles in the Journal of Healthcare Information Management and the International Journal of Medical Informatics, and was a Section Editor of the 2010 best-selling book from HIMSS, ""Improving Medication Use and Outcomes with Clinical Decision Support: A Step-by-Step Guide." He has lectured and presented with the Scottsdale Institute, HIMSS and at the Cerner Health Conference. He is also the chair of the UT School of Biomedical Informatics alumni association for the 2011 academic year. Siraj recently became a "Certified Professional in Health Information Management Systems (CPHIMS)" in January of 2010 that is administered by the Health Information & Management Systems Society (HIMSS). Siraj is currently working as the Manager of Clinical Solutions for Clinical Decision Support in the Medical Informatics department at Memorial Hermann. His key role is to oversee the design & successful implementation of clinical decision support tools at Memorial Hermann.

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 Dr. Smith was recruited from Ohio State University to become the first Chairman of the Department of Health Informatics at the University of Texas Health Science Center at Houston. He was instrumental in recruiting many of the original faculty from Ohio State University. In January 2003, he became the Interim Dean. In December 2005, Dr. Smith was appointed Dean of the School of Health Information Sciences at the University of Texas Health Science Center at Houston. He is a former team Leader of Medical Informatics and Healthcare Systems at the National Aeronautics and Space Administration (NASA) - Johnson Space Center, Houston, Texas. His work focused on the collection, storage, retrieval, analysis, and transmission of medical information related to NASA spaceflight. Dr. Smith was appointed Co-Director of the Bioinformatics component of the CTSA grant awarded to The University of Texas Health Science Center in 2006. He joined a large team of medical professionals who have established the Center for Clinical and Translational Sciences in partnership with The University of Texas Health Science Center at Houston, MD Anderson Cancer Center, and the Memorial Hermann Hospital System. Dr. Smith serves as an informatics consultant to other universities seeking application for a CTSA grant. His research interests include artificial intelligence, modeling complex problem-solving in healthcare, implementation of decision support and tutoring systems, and the application of cognitive science to understanding human-computer interaction. He has served on several national committees associated of the American Medical Informatics Association and also serves on several university advisory boards in review of their informatics programs.

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Dr. Souther has taught undergraduate and graduate nursing courses at several universities. She has been an innovator to move education programs into the electronic era. She has worked as a consultant in the Health Informatics field. Currently, Dr. Souther is an implementation specialist at Texas Children's Hospital with the use of an electronic medical record.

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Dr. Vogler has a nursing background and has taught, held administrative positions and served as a school of nursing chief information officer and executive director of an information and educational technology center that provided information services and educational support. He has served on university level information, technology and

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