Luddy School of Informatics, Computing and Engineering

Welcome to the Luddy School of Informatics, Computing and Engineering!

Moore's Law says that computing power doubles every 18 months. Regardless of whether that law is literally correct, it illustrates the rapid changes in information technology that will continue for the foreseeable future. The Luddy School of Informatics, Computing and Engineering prepares students to meet the continuing demand for information technology professionals who know how to grow and adapt to this environment of rapid technological change.

Informatics is focused on the best applications of technologies and emphasizes the social and psychological aspects of information technology. Some have called informatics "technology with a human face." Informatics prepares professionals to use information technology to solve problems in a variety of settings. The degrees emphasize the development of new uses for technologies, always keeping in mind the needs of people and the best and most appropriate uses for technology.

Informatics, Computing and Engineering students have:

- a technical understanding of how computing systems and programs operate
- an ability to adapt/assess and apply new trends in information technology (IT)
- well-developed problem-solving skills
- experience working on a team, such as those formed for the senior capstone experience
- well-developed communications skills to clearly convey solutions and observations to others
- an understanding of social and ethical principles as they relate to IT issues
- the ability to create 3-D animations to help explain surgery to patients
- accelerated drug discovery through information technology
- developed computer applications to manage disaster relief
- explored human interactions with computers, mobile devices, and robots

Informatics is all of this - and so much more. Harnessing the power and possibility of technology, Informatics turns data and information into knowledge that people can use every day. In the world of information and technology, it's the bridge to all things useful. Informatics is the future.

Degrees from the Luddy School of Informatics, Computing and Engineering are unique because they involve students in learning how information technology relates to a traditional discipline in the sciences, liberal arts, or professions. Students of Informatics learn to solve real problems that directly impact our lives and the lives of those around us. They use their technology and problem solving skills to make a difference in the world. For students interested in a career with infinite potential, Informatics stands out as a strong, flexible and dynamic field of study.

The undergraduate curriculum looks at information technology from a balanced perspective. It includes a technical core in the areas of mathematical foundations, distributed information, human-computer interaction, social/organization informatics, and media arts and science. In addition to knowledge of core informatics and of informatics in the context of a traditional discipline, students must take a set of general-education courses to ensure that they can communicate clearly in both written and spoken English, read effectively, and reason quantitatively. They must be able to raise and rationally debate ethical concerns suggested by information technologies and their interactions with other people. Students also must have some knowledge of the world and its peoples, and their cultural, artistic, and scientific achievements. To this end, the general-education requirement exposes students to the arts and humanities, social and historical studies, and the natural sciences.

Graduate program curricula apply information technology to a specific domain. Graduate students in the Luddy School of Informatics, Computing and Engineering study under faculty who are leaders in the areas of bioinformatics, health informatics, human-computer interaction, library science and media arts and science. Students in the Luddy School of Informatics, Computing and Engineering's graduate programs also learn from a community of fellow student visionaries, with classmates who come from all over the world and across disciplines to advance informatics research and build life-long careers.

The Luddy School of Informatics, Computing and Engineering offers a variety of educational programs to meet a variety of needs in the evolving world of information technology:

- Bachelor of Science in Applied Data and Information Science
- Bachelor of Arts in Artificial Intelligence
- Bachelor of Science in Biomedical Informatics
- Bachelor of Science in Data Science
- Bachelor of Science in Health Information Management
- Bachelor of Science in Informatics
- Bachelor of Science degree in Media Arts and Science
- Informatics and Media Arts and Science double major to learn to be a Full-Stack Developer
- Minors and Certificates
  - 3D Graphics and Animation Minor
  - Digital Humanities Minor
  - Game Design and Development Minor
  - Informatics Minor
  - Studio Art and Technology Minor
  - Video Production Minor
  - Applied Data Science Certificate
  - Applied Information Science/Data Studies Certificate
  - Artificial Intelligence
  - Human-Computer Interaction Certificate
  - Legal Informatics Certificate
  - Medical Coding Certificate
  - Multi-device Development (Online Bootcamp)

    - Software Bots for Cognitive Automation
    - Virtual Production
    - Post-Baccalaureate Certificate in Health Information Management

- Master of Library Science - with options for dual degrees in History (M.A.), Philanthropic Studies (M.A.), Health Informatics (M.A.), Law (J.D.), Public Management (certificate) and Nonprofit Management Certificate.
- Master of Science degrees in Applied Data Science, Bioinformatics, Crisis Informatics (Applied Data Science), Health Informatics, Human-Computer Interaction, Media Arts and Science, Sports Analytics (Applied Data Science) and User Experience Design (Applied Data Science).
- Graduate certificates in Archive Management, Biomedical Data Analytics, Clinical Informatics, Health Information Management and Exchange, Health Information Security, Health Information Systems Architecture, Human-Compter Interaction, Omics Technology and Precision Medicine, Public Health Professionals and School Library Certificate.

The Luddy School of Informatics, Computing and Engineering also offers the following innovative, accelerated 5-year B.S./M.S. degree programs in the following areas:

- B.S. Applied Data and Information Science + M.S. Applied Data Science
- B.S. Applied Data and Information Science + Master's in Library and Information Science
- B.S. Health Information Management + M.S. Health Informatics
- B.S. Informatics + M.S. Applied Data Science
- B.S. Informatics + M.S. Bioinformatics
- B.S. Informatics + M.S. Health Informatics
- B.S. Informatics + M.S. Human-Computer Interaction
- B.S. Informatics + Master of Jurisprudence
- B.S. Media Arts & Science + M.S. Human-Computer Interaction
- B.S. Media Arts & Science + M.S. Media Arts & Science
- B.S. Biology + M.S. Bioinformatics
- B.S. Biomedical Informatics + M.S. Bioinformatics
- B.S. Biomedical Informatics + M.S. Health Informatics
- B.S. Health Sciences + M.S. Health Informatics
- B.S. Nursing + M.S. Health Informatics
- B.S. Sports Management + M.S. Applied Data Science with a specialization in Sports Analytics

Last Updated: 3/2023

Contact Information

Contact Information

Luddy School of Informatics, Computing, and Engineering 535 W. Michigan Street, IT 500
Indianapolis, IN 46202Phone: 317-278-4636
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soicindy@iupui.edu

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Department of BioHealth Informatics Phone: 317-278-7602soicindy@iupui.edu

Department of Human-Centered Computing Phone: 317-278-7606soicindy@iupui.edu
Department of Library and Information Science Phone: 317-278-4636
soicindy@iupui.eduLast updated: 8/4/2020

Overview

Mission, Vision, and Values

Our mission
Across a broad range of applications, we unite the full breadth of computing, information science, and technology to lead education and research forward, and enhance the well-being of humanity.

Our vision
To be an unstoppable force for society-centered scientific and technological innovation.

Our values
The following fundamental principles guide our actions as we pursue technical excellence for positive societal impact:

Society-centered science and technology We keep humanity firmly at the center of our approach and understand the human benefits and consequences of our work.

Thought leadership We strive to become national thought leaders and advance the thinking and understanding of our disciplines.

Excellence and integrity We hold ourselves to the highest standards of scholarly principles and distinction.

Belongingness We proactively address barriers to create inclusive experiences and promote systems where everyone has an equal chance at success.

Teamwork and transparency We enhance collaboration knowing that our whole is more impactful than its parts.

The IU Luddy School of Informatics, Computing, and Engineering, continues to be completely unique in composition, intellectual breadth, and mission. With a twenty-first century sensibility, the Luddy School integrates computing, social science, and information systems design in unique ways.

The Luddy School of Informatics, Computing, and Engineering fosters a broad and interdisciplinary view of informatics and uses this view to explore and expand knowledge in informatics education and research. Along with the many schools and departments located on the Indiana University Indianapolis urban campus, The Luddy School of Informatics, Computing, and Engineering is firmly committed to a welcoming environment, a diverse

faculty and student body, and to efforts which support Indiana's economic development.

Together with The School of Informatics, Computing, and Engineering at IU Bloomington, The Luddy School of Informatics, Computing, and Engineering aims to lead the nation in creating a new, broad and interdisciplinary view of informatics and uses this viewpoint as the foundation for their strategic focus areas:

Student Success and Opportunity

Luddy commits to setting the gold standard in teaching and learning. We embrace a culture of technical excellence and will continuously improve our teaching to meet the evolving needs of society. We will provide a diverse student population with opportunities to apply their knowledge to real-world challenges and ensure every student's success is our success.

Transformative Research and Creativity

Luddy will pursue innovative and transformative research and creative activity as
a crucial societal and economic outcome of academic excellence. We will draw upon and integrate the strengths of our unique array of socio-technical disciplines to propel societal goals.

Service to Our State and Beyond

Luddy will leverage its expertise and capabilities to serve communities across our state, improving the lives of Hoosiers, strengthening cultural and economic vitality, and pursuing innovation and knowledge that improve the human condition.

School Culture and Operations

Luddy will strengthen the ways we work and collaborate with one another, as well as the underlying systems and structures that support us, to ensure the conditions for our success.

Education and Research

The Luddy School of Informatics, Computing, and Engineering's primary emphasis is in education and research, offering a broad array of B.S., M.S., and Ph.D., programs and a research agenda that emphasizes the breadth of informatics as an interdisciplinary field of study. The School is at the forefront of innovation in education and provides an informatics curriculum which focuses on computing and information technology, while giving equal attention to the complex interactions of technology, individuals, and society. Students of Informatics learn skills which allow them to use computing to solve real human problems in areas such as healthcare, education, poverty, security, and the environment.

Equally important is the fact that Informatics maintains a strong focus on the human use of computing. For example, informatics students build new computing tools and applications while studying how people interact with those technologies and how those technologies shape our relationships, our organizations, and our community. Informatics is a professional school which goes beyond the study of technology in and of itself, to identify, define, and address information problems in a range of disciplines with a variety of technologies and methodologies.

The Luddy School of Informatics, Computing, and Engineering also conducts research in a wide range of computing and informatics foundations, applications, and their implications. The Luddy School of Informatics, Computing, and Engineering brings a unique perspective that combines information science with a deep understanding of domain-specific areas of research, such as the biological, health, and life sciences, medical and biomedical sciences, cognitive and social sciences, media arts and science, the law and legal domains, business, and human-computer interaction design and usability engineering.

Economic Development and Entrepreneurship

The Luddy School of Informatics, Computing, and Engineering is also deeply engaged in the area of economic development and entrepreneurship. In addition to its primary mission in education and research, The Luddy School of Informatics, Computing, and Engineering trains well-equipped graduates for a wide range of computing and information technology occupations by placing a special emphasis on:

1. partnering with information technology businesses to address their professional needs in the state of Indiana, and
2. supporting a culture of entrepreneurship for its students, faculty and alumni.

Diversity

The Luddy School of Informatics, Computing, and Engineering also fosters an inclusive educational and research culture and environment by:

1. attracting women and under-represented minorities who have a wide range of intellectual interests, talents, and professional goals, and
2. achieving national recognition as an exemplar for diversity.

Last updated: 3/2024

Applied Data Science

Applied Data Science M.S. Admissions

Requirements

- A bachelor's degree
- Overall GPA of 3.0 or higher on a 4.0 scale
- Graduate Record Exam (GRE) optional for masters' students
- Calculus and linear algebra
- Programming

Online Application

Complete and submit the IU Indianapolis Graduate Online Application form. Choose *Informatics* as your Academic Program and *Applied Data Science M.S.* as your Academic Plan. Indicate one of the following subplans:

- Applied Data Science
- Sports Analytics
- User Experience Design

All documents requested below must be uploaded electronically as PDFs with the online application. Do not

mail or email any supporting materials to the Luddy School of Informatics, Computing, and Engineering.

The Graduate Admissions Committee will not review applications until the application fee and all required materials are completed and received by the deadline.

Resume

Submit a resume or curriculum vitae (CV) listing your education, work experience, research, honors and awards, and mathematical, statistical, and computer programming experience.

Personal Statement

Submit a 500–750-word personal statement in your own words indicating

- Why you're applying to the M.S. in Applied Data Science program
- Your post-graduation career plans

Transcripts

Submit all transcript(s) and/or academic documents for every institution of higher education you attended. If a transcript is not in English, upload an English translation certified by the college issuing the transcript.

All transcripts and/or academic documents uploaded with the online application are considered unofficial. Your unofficial transcript will be used for application review and admission. If you are admitted, you must submit your official hard copy transcripts directly to the IU Indianapolis Graduate School after you arrive on campus. If you are currently finishing your bachelor's degree, you must submit a document that certifies the awarding of the degree.

We do not require transcripts from Indiana University campuses.

References

Submit three references from academic instructors and/or employers. To submit references, you will enter contact information for each person on your electronic application. The reference will receive a form via email to fill out and submit electronically.

TOEFL or IELTS

Submit proof of English proficiency if your native language is not English. This requirement may be waived if you are a citizen of the United States or a country where English is the official language for higher education, are completing your bachelor's or master's degree in the United States or a country that is predominately English speaking.

On-Campus Programs (except Computer Science)

90 TOEFL, 7.0 IELTS, or 130 Duolingo

On-Campus Computer Science Program

80 TOEFL, 6.5 IELTS, or 115 Duolingo

100% Online Programs:

100 TOEFL or 7.5 IELTS

Upload a copy of your test score results in the *Documents Section* (under *Test Score Report* upload option) on the online application. TOEFL test results may also be sent through ETS to IU Indianapolis school code 1325.

Last updated: 3/2024

Bioinformatics

Bioinformatics

Students are expected to have an introductory background in computing or biology. Our faculty will help you select courses that build on your experience and elevate your skills—integrating informatics, computer science, information systems, math, biology, and related areas.

Promising applicants lacking competencies necessary for admission may be allowed to take courses that will satisfy those requirements, as determined by Luddy School of Informatics, Computing, and Engineering faculty. Those courses, however, would not count towards degree or certificate completion.

Prerequisites

- Minimum of a Bachelor's degree *(with demonstrated technical skills)*
- Minimum Overall GPA: 3.0 *(4.0 point scale)*
- Graduate Record Exam (GRE) scores from within the past five years if you are seeking direct financial assistance (such as an assistantship or fellowship) from the Luddy School of Informatics, Computing, and Engineering. A GRE score is not required to submit your FAFSA or to seek other federal or private financial assistance opportunities.

Students holding a bachelor's degree in computer science or a related field from an accredited four-year collegiate institution must have completed all or part of the prerequisite courses listed below:

- K322 Genetics and Molecular Biology and K324 Cell Biology or BIOL 507 Molecular Biology

Students holding a bachelor's degree in life sciences or a related field from an accredited four-year collegiate institution must have completed all or part of the prerequisite courses listed below:

- Programming in C, C++, or Java (3 credits)
- Programming/Database (3 credits) (e.g. N510 Web-Database Concepts)
- Statistics (3 credits) (e.g. SPEA K300 or PSY B305)

How to Apply

The Graduate Admissions Committee will not review applications until the application fee and all required materials are completed and received by the deadlines indicated.

Submit a resume, transcripts, a personal statement, and letters of recommendation to:

Graduate Admissions Committee
Luddy School of Informatics, Computing, and Engineering
535 W. Michigan Street, IT 421
Indianapolis, IN 46202

1. Complete and submit the IU Indianapolis Graduate Online Application form. Paper applications are not accepted.
2. Submit a resume listing your education, work, research, honors/awards and computer

programming experience. This may be attached to your online application or sent separately.
3. Submit a personal statement (visit the IU Writing Center for instructions on how to write such a statement). This may be attached to your online application or sent separately. Your personal statement should indicate the following:
   - Why you're applying to the program
   - Your post-graduation career plans
4. Submit all official transcripts from previous colleges and universities. *NOTE: we do not require transcripts from Indiana University campuses.*
5. Submit three references from academic instructors and/or employers. To submit references, you will input contact information for each person on your electronic application. The reference will receive a form via email to fill out and submit electronically.
6. The Graduate Record Examination (GRE) is optional for masters' students.
7. Submit English language proficiency exam score (International and non-native English speaking students only – see instructions below).

Special Instructions for International Students and Non-native English Speakers
Submit proof of English proficiency if your native language is not English. This requirement may be waived if you are a citizen of the United States or a country where English is the official language for higher education, are completing your bachelor's or master's degree in the United States or a country that is predominately English speaking.

On-Campus Programs (except Computer Science)

90 TOEFL, 7.0 IELTS, or 130 Duolingo

On-Campus Computer Science Program

80 TOEFL, 6.5 IELTS, or 115 Duolingo

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Last updated: 3/2024

Computer Science
Computer Science

Courses in
- Calculus
- Linear algebra
- Statistics or probability theory
- Programming
- Data structures
- Discrete structures or discrete mathematics

- Minimum of a Bachelor's degree *(with demonstrated technical skills)*
- Minimum Overall GPA: 3.0 *(4.0 point scale)*
- Graduate Record Exam (GRE) optional for masters' applicants

How to Apply

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2. Submit a resume listing your education, work, research, honors/awards and computer programming experience. This may be attached to your online application or sent separately.
3. Submit a personal statement (visit the IU Writing Center for instructions on how to write such a statement). This may be attached to your online application or sent separately. Your personal statement should indicate the following:
   - Why you're applying to the program
   - Your post-graduation career plans
4. Submit all official transcripts from previous colleges and universities. *NOTE: we do not require transcripts from Indiana University campuses.*
5. Submit three references from academic instructors and/or employers. To submit references, you will input contact information for each person on your electronic application. The reference will receive a form via email to fill out and submit electronically.
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On-Campus Computer Science Program

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Last updated: 3/2024

Human-Computer Interaction
Human-Computer Interaction

Successful applicants to our **Master of Science program in Human-Computer Interaction** must have a strong background in computing and information technology. You should be able to demonstrate the skills and knowledge required of the undergraduate Informatics degree.

Promising applicants lacking competencies necessary for admission may be allowed to take courses that will satisfy those requirements, as determined by Luddy School of Informatics, Computing, and Engineering faculty. Those courses, however, would not count towards degree or certificate completion.

Prerequisites

- Minimum of a Bachelor's degree *(with demonstrated technical skills)*
- Minimum Overall GPA: 3.0 *(4.0 point scale)*
- Graduate Record Exam (GRE) is optional for masters' students.

Successful applicants will have a foundation of core knowledge and skills (from either past education or work experience) in one or more of the following proficiency areas:

Successful applicants should have knowledge and skills in **one or more** of the following areas:

Programming

Proficiency in:

- One or more programming languages (e.g., C, C++, Java, Javascript, or Python)
- Programming methodologies, such as system design and architectures or problem and algorithm analysis
- Other computing knowledge, such as artificial intelligence and database administration

Design

Proficiency with:Principles and processes of visual communication, industrial design, digital media

- Knowledge and application of 3D animation or modeling tools
- Design methodologies for 2D and 3D product development
- Conceptual modeling, prototyping, and product delivery
- Fundamental concepts of visual communication (e.g., page design/layout)
- Design principles, typography, and color theory
- Application of digital authoring tools for Web or interface design

Social Sciences

Coursework in:

- Psychology (general, cognitive, and behavioral)
- Sociology and anthropology (ethnography)
- Cross-cultural psychology and communication, information management, or information and library science
- Business, product strategy, management, marketing, and related areas
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How to Apply

The Graduate Admissions Committee will not review applications until the application fee and all required materials are completed and received by the deadlines indicated.

Submit a resume, transcripts, a personal statement, and letters of recommendation to:

Graduate Admissions Committee
Luddy School of Informatics, Computing, and Engineering
535 W. Michigan Street, IT 421
Indianapolis, IN 46202

1. Complete and submit the IU Indianapolis Graduate Online Application form. Paper applications are not accepted. Choose "M.S. Informatics" and Human-Computer Interaction in the "Academic Interest" section.
2. Submit a resume listing your education, work, research, honors/awards and computer programming experience. This may be attached to your online application or sent separately.
3. Submit a personal statement (visit the IU Writing Center for instructions on how to write such a statement). This may be attached to your online application or sent separately. Your personal statement should indicate the following:
    - Why you're applying to the program
    - Your post-graduation career plans
4. Submit all official transcripts from previous colleges and universities. *NOTE: we do not require transcripts from Indiana University campuses.*
5. Submit three references from academic instructors and/or employers. To submit references, you will input contact information for each person on your electronic application. The reference will receive a form via email to fill out and submit electronically.
6. Submit English language proficiency exam score (International and non-native English speaking students only – see instructions below).

Special Instructions for International Students and Non-native English Speaker

Submit proof of English proficiency if your native language is not English. This requirement may be waived if you are a citizen of the United States or a country where English is the official language for higher education, are completing your bachelor's or master's degree in the United States or a country that is predominately English speaking.

On-Campus Programs (except Computer Science)

90 TOEFL, 7.0 IELTS, or 130 Duolingo

On-Campus Computer Science Program

80 TOEFL, 6.5 IELTS, or 115 Duolingo

100% Online Programs:

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Last updated: 3/2024

Health Informatics

Health Informatics

Promising applicants lacking competencies necessary for admission to our **Master of Science in Health Informatics** program may be allowed to take courses that will satisfy those requirements, as determined by Luddy School of Informatics, Computing, and Engineering and Computing faculty. Those courses, however, would not count towards degree or certificate completion. Successful applicants will have:

- Strong background in one or more of the following:
  - Biochemistry
  - Biology
  - Computer science
  - Engineering
  - Health information management
  - Mathematics
  - Nursing
  - Physics
  - Statistics
- Successful coursework (or equivalent) in:
  - Computer programming (e.g., C, C++, Java, Javascript, or Python)
  - Databases
  - Medical terminology
  - Human anatomy and physiology

Prerequisites

- Minimum of a Bachelor's degree in computer science, engineering, biology, biochemistry, nursing, mathematics, statistics, physics, health information administration, or other similar or health-related discipline.
- Successful coursework (or equivalent) in programming (i.e. C, C++, Java or equivalent), databases, medical terminology, human anatomy and physiology.
- Minimum Overall GPA: 3.0 *(4.0 point scale)*
- Graduate Record Exam (GRE) not required for masters' students

How to Apply

The Graduate Admissions Committee will not review applications until the application fee and all required materials are completed and received by the deadlines indicated.

Submit a resume, transcripts, a personal statement, and letters of recommendation to:

Graduate Admissions Committee
Luddy School of Informatics, Computing, and Engineering
535 W. Michigan Street, IT 421
Indianapolis, IN 46202

1. Complete and submit the IU Indianapolis Graduate Online Application form. Paper applications are not accepted. Choose "M.S. Informatics" and Health Informatics in the "Academic Interest" section.
2. Submit a resume listing your education, work, research, honors/awards and computer programming experience. This may be attached to your online application or sent separately.
3. Submit a personal statement (visit the IU Writing Center for instructions on how to write such a statement). This may be attached to your online application or sent separately. Your personal statement should indicate the following:
   - Why you're applying to the program
   - Your post-graduation career plans
4. Submit all official transcripts from previous colleges and universities. *NOTE: we do not require transcripts from Indiana University campuses.*
5. Submit three references from academic instructors and/or employers. To submit references, you will input contact information for each person on your electronic application. The reference will receive a form via email to fill out and submit electronically.
6. Submit English language proficiency exam score (International and non-native English speaking students only – see instructions below).

Special Instructions for International Students and Non-native English Speaker

Submit proof of English proficiency if your native language is not English. This requirement may be waived if you are a citizen of the United States or a country where English is the official language for higher education, are completing your bachelor's or master's degree in the United States or a country that is predominately English speaking.

On-Campus Programs (except Computer Science)

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On-Campus Computer Science Program

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Last updated: 3/2024

Master's Program Admissions

Master's Program Admissions

Applications for all graduate certificate and **M.S. programs** must be received by **January 15 (early action), March 1 (international students) and May 1 (domestic students) for fall admission** and **August 1 (international students) and October 1 (domestic students) for spring admission**.

Applications for admission to the **M.L.I.S. program** must be received by **June 1 for fall admission, November 15 for spring admission** and by **March 1 for summer admission**.

The Graduate Admissions Committee will not review applications until the application fee and all required materials are completed and received by the deadlines indicated.

Last updated: 3/2024

Library and Information Science

Library and Information Science (M.L.I.S.)

The Department of Library and Information Science welcomes applications to our **Masters of Library and Information Science** program from individuals interested in entering the library and information professions. Applicants to the Indianapolis program bring a range of backgrounds to their graduate education, through both their prior education and work experience. Applications from those who have been in the work force and from recent graduates are equally desirable.

Admission Requirements
Bachelor's Degree Students holding a bachelor's degree from regionally accredited four-year collegiate institutions are eligible to apply for admission. Applicants in the final year of their undergraduate program may apply and be granted admission conditional upon being awarded the bachelor's degree.

- Minimum undergraduate GPA of 3.0 on a 4.0 scale or 3.2 in the latest graduate degree or representative graduate hours.
- GRE scores are required for applicants not meeting minimum GPA requirements.
- **How to Apply**

The Graduate Admissions Committee will not review applications until the application fee and all required materials are completed and received by the deadlines indicated.

Have transcripts sent directly to:

Department of Library and Information Science
Luddy School of Informatics, Computing, and Engineering
535 West Michigan Street, IT 419
Indianapolis, IN 46202

1. Complete and submit the IU Indianapolis Graduate Online Application form. Paper applications are not accepted.
2. Submit a 750 – 1500 word personal statement. Your personal statement should indicate the following:
    - In what manner do you see yourself as a future library/information leader in your future organization and community?
    - What examples can you provide that illustrate how you work as a constructive member of a team to solve problems?
    - Provide your perspective on or experiences with technology in information services.
3. Submit official transcripts from all post-secondary colleges and universities (graduate and undergraduate), except for Indiana University campuses.
4. Submit three references from academic instructors and/or employers. To submit references, you will input contact information for each person on your electronic application. The reference will receive a form via email to fill out and submit electronically.
5. If necessary, complete the Graduate Record Examination (GRE) and ensure that IU Indianapolis receives your score report. The IU Indianapolis and MLIS program codes are listed above. The Luddy School of Informatics, Computing, and Engineering school code for the GRE is 1325 – enter this code on the exam's answer sheets.
6. For international and non-native English speaking students, submit English language proficiency exam score (see below).

Special Instructions for International Students and Non-native English Speakers

Submit proof of English proficiency if your native language is not English. This requirement may be waived if you are a citizen of the United States or a country where English is the official language for higher education, are completing your bachelor's or master's degree in the United States or a country that is predominately English speaking.

On-Campus Programs (except Computer Science)

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On-Campus Computer Science Program

80 TOEFL, 6.5 IELTS, or 115 Duolingo

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100 TOEFL or 7.5 IELTS

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Last updated: 3/2024

Bioinformatics

Bioinformatics

Successful applicants to our **Ph.D. program in Bioinformatics** must have a strong background in computing, information technology, and biology. You should be able to demonstrate the skills and knowledge required of the undergraduate Informatics degree.

Promising applicants lacking competencies necessary for admission may be allowed to take courses that will satisfy those requirements, as determined by Luddy School of Informatics, Computing, and Engineering faculty. Those courses, however, would not count towards degree or certificate completion.

Prerequisites

- Minimum of a Bachelor's degree *(with demonstrated technical skills)*
- Minimum Overall GPA: 3.0 *(4.0 point scale)*
- Graduate Record Exam (GRE) scores from within the past five years.

- Students may test out of these.

  For students with a biology background:

  - INFO-B 573 Programming for Chem/Life Science

  For students with a computing background:

  - K322 Genetics and Molecular Biology and K324 Cell Biology or

- BIOL 507 Molecular Biology

How to Apply
The Graduate Admissions Committee will not review applications until the application fee and all required materials are completed and received by the deadlines indicated.

Submit a resume, transcripts, a personal statement, and letters of recommendation to:

Graduate Admissions Committee
Luddy School of Informatics, Computing, and Engineering
535 W. Michigan Street, IT 419

1. Complete and submit the online application form here. Paper applications are not accepted. Choose "Ph.D. Informatics" and "Informatics" in the "Academic Interest" section. Be sure to indicate on your personal statement your intended area of specialization.
2. Submit a resume listing your education, work, research, honors/awards and computer programming experience. This may be attached to your online application or sent separately.
3. Submit a personal statement (visit the IU Writing Center for instructions on how to write such a statement). This may be attached to your online application or sent separately. Your personal statement should indicate the following:
   - Why you're applying to the program
   - Your post-graduation career plans
   - Your intended area of specialization
4. Submit all official transcripts from previous colleges and universities. *NOTE: we do not require transcripts from Indiana University campuses.*
5. Submit three references from academic instructors and/or employers. To submit references, you will input contact information for each person on your electronic application. The reference will receive a form via email to fill out and submit electronically.
6. Complete the Graduate Record Examination (GRE) and ensure that IU Indianapolis receives your score report from the GRE exam board. The Luddy School of Informatics, Computing, and Engineering school code for the GRE is 1325 – enter this code on the exam's answer sheets.
7. Submit English language proficiency exam score (International and non-native English speaking students only – see instructions below).

Special Instructions for International Students and Non-native English Speaker

Submit proof of English proficiency if your native language is not English. This requirement may be waived if you are a citizen of the United States or a country where English is the official language for higher education, are completing your bachelor's or master's degree in the United States or a country that is predominately English speaking.

On-Campus Programs (except Computer Science)

90 TOEFL, 7.0 IELTS, or 130 Duolingo

On-Campus Computer Science Program

80 TOEFL, 6.5 IELTS, or 115 Duolingo

Upload a copy of your test score results in the *Documents Section* (under *Test Score Report* upload option) on the online application. TOEFL test results may also be sent through ETS to IU Indianapolis school code 1325.

Last updated: 3/2024

Computer Science

Computer Science

The prepares graduates to develop and evaluate novel approaches to collecting, organizing, managing, and extracting knowledge and insights from massive, complex, heterogeneous datasets. Graduates will learn to define and investigate relevant research problems in data science.

Prerequisites

- A bachelor's degree; master's preferred
- Overall GPA of 3.5 or higher on a 4.0 scale
- A course in multivariate calculus, linear algebra, and statistics or probability theory
- A course in programming, data structures, machine organization, and discrete structures or discrete mathematics

How to Apply

The Graduate Admissions Committee will not review applications until the application fee and all required materials are completed and received by the deadlines indicated.

Submit a resume, transcripts, a personal statement, and letters of recommendation to:

Graduate Admissions Committee
Luddy School of Informatics, Computing, and Engineering
535 W. Michigan Street, IT 419
Indianapolis, IN 46202

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Last updated: 3/2024

Human-Computer Interaction

Human-Computer Interaction

Successful applicants to our Ph.D. program in **Human-Computer Interaction** must have a strong background in computing and information technology. You should be able to demonstrate the skills and knowledge required of the undergraduate Informatics degree.

Promising applicants lacking competencies necessary for admission may be allowed to take courses that will satisfy those requirements, as determined by Luddy School of Informatics, Computing, and Engineering faculty. Those courses, however, would not count towards degree or certificate completion.

Prerequisites

- Minimum of a Bachelor's degree *(with demonstrated technical skills)*
- Minimum Overall GPA: 3.0 *(4.0 point scale)*
- Graduate Record Exam (GRE) scores from within the past five years if you are seeking direct financial assistance (such as an assistantship or fellowship) from the School of Informatics and Computing. A GRE score is not required to submit your FAFSA or to seek other federal or private financial assistance opportunities.

Successful applicants will have a foundation of core knowledge and skills (from either past education or work experience) in one or more of the following proficiency areas:

Successful applicants for the graduate degrees in Human-Computer Interaction will have knowledge and skills (from either past education or work experience) in **one or more** of the following proficiency areas:

Programming

Proficiency in programming/scripting, including:

- One or more languages (e.g., JavaScript, Java, C++, Python)
- A basic understanding of programming methodologies, such as system design and architectures or problem and algorithm analysis
- Other computing knowledge, such as artificial intelligence and database administration

Design

Proficiency with the principles and processes of visual communication, industrial design, digital media, or other disciplines using design theory and practice, including:

- Knowledge and application of 3D animation and/or modeling tools
- Design methodologies for 2D and 3D product development
- Conceptual modeling, prototyping, and product delivery
- Fundamental concepts of visual communication (e.g., page design/layout)
- Design principles, typography and color theory
- Knowledge and application of a range of digital (vector and raster) authoring tools for Web or interface design

Social Sciences

Coursework in one or more of the following areas:

- Psychology (general, cognitive, and behavioral)
- Sociology and anthropology (ethnography)
- Cross-cultural psychology and communication, information management, and/or information and library science
- Business, product strategy, management, marketing and related areas.

How to Apply

The Graduate Admissions Committee will not review applications until the application fee and all required materials are completed and received by the deadlines indicated.

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Graduate Admissions Committee
Luddy School of Informatics, Computing, and Engineering
535 W. Michigan Street, IT 419
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2. Submit a resume listing your education, work, research, honors/awards and computer

programming experience. This may be attached to your online application or sent separately.
3. Submit a personal statement (visit the IU Writing Center for instructions on how to write such a statement). This may be attached to your online application or sent separately. Your personal statement should indicate the following:
    - Why you're applying to the program
    - Your post-graduation career plans
    - Your intended area of specialization
4. Submit all official transcripts from previous colleges and universities. *NOTE: we do not require transcripts from Indiana University campuses.*
5. Submit three references from academic instructors and/or employers. To submit references, you will input contact information for each person on your electronic application. The reference will receive a form via email to fill out and submit electronically.
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On-Campus Computer Science Program

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Last updated: 3/2024

Health Informatics

Health Informatics

Promising applicants to the **Ph.D. in Health Informatics program** lacking competencies necessary for admission may be allowed to take courses that will satisfy those requirements, as determined by Luddy School of Informatics, Computing, and Engineering faculty. Those courses, however, would not count towards degree or certificate completion.

Prerequisites

- Minimum of a Bachelor's degree in computer science, engineering, biology, biochemistry, nursing, mathematics, statistics, physics, health information administration, or other similar or health-related discipline.
- Successful coursework (or equivalent) in programming (i.e. C, C++, Java or equivalent), databases, medical terminology, human anatomy and physiology.
- Minimum Overall GPA: 3.0 *(4.0 point scale)*
- Graduate Record Exam (GRE) scores from within the past five years.

How to Apply

The Graduate Admissions Committee will not review applications until the application fee and all required materials are completed and received by the deadlines indicated.

Submit a resume, transcripts, a personal statement, and letters of recommendation to:

Graduate Admissions Committee
Luddy School of Informatics, Computing, and Engineering
535 W. Michigan Street, IT 419
Indianapolis, IN 46202

1. Complete and submit the online application form at this link: https://graduate.iupui.edu/admissions/apply.html. Paper applications are not accepted. Choose "Ph.D. Informatics" and "Informatics" in the "Academic Interest" section. Be sure to indicate on your personal statement your intended area of specialization.
2. Submit a resume listing your education, work, research, honors/awards and computer programming experience. This may be attached to your online application or sent separately.
3. Submit a personal statement (visit the IU Writing Center for instructions on how to write such a statement). This may be attached to your online application or sent separately. Your personal statement should indicate the following:
    - Why you're applying to the program
    - Your post-graduation career plans
    - Your intended area of specialization
4. Submit all official transcripts from previous colleges and universities. *NOTE: we do not require transcripts from Indiana University campuses.*
5. Submit three references from academic instructors and/or employers. To submit references, you will input contact information for each person on your electronic application. The reference will receive a form via email to fill out and submit electronically.
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Last updated: 3/2024

PhD Programs

Ph.D. Programs Admission

Applicants to the **Ph.D. program** are only eligible for fall admission and must submit applications by **January 15**.

The Graduate Admissions Committee will not review applications until the application fee and all required materials are completed and received by the deadlines indicated. Specific application details are available at the program/degree links in the left navigation bar.

Last updated: 04/24/2017

Data Science

Data Science

The prepares graduates to develop and evaluate novel approaches to collecting, organizing, managing, and extracting knowledge and insights from massive, complex, heterogeneous datasets. Graduates will learn to define and investigate relevant research problems in data science.

Prerequisites

- Minimum of a Bachelor's degree in a related social science, health, data science or computing discipline computer science.
- Successful coursework (or equivalent) in programming (i.e. C++, HTML/JavaScript, JAVA, Python or equivalent),programming methodologies, systems knowledge such as artificial intelligence and database administration.
- Minimum Overall GPA: 3.0 *(4.0 point scale)*
- Graduate Record Exam (GRE) scores from within the past five years.

How to Apply

The Graduate Admissions Committee will not review applications until the application fee and all required materials are completed and received by the deadlines indicated.

Submit a resume, transcripts, a personal statement, and letters of recommendation to:

Graduate Admissions Committee
Luddy School of Informatics, Computing, and Engineering
535 W. Michigan Street, IT 419
Indianapolis, IN 46202

1. Complete and submit the online application form at this link: https://graduate.iupui.edu/admissions/apply.html. Paper applications are not accepted. Choose "Ph.D. Informatics" and "Informatics" in the "Academic Interest" section. Be sure to indicate on your personal statement your intended area of specialization.
2. Submit a resume listing your education, work, research, honors/awards and computer programming experience. This may be attached to your online application or sent separately.
3. Submit a personal statement (visit the IU Writing Center for instructions on how to write such a statement). This may be attached to your online application or sent separately. Your personal statement should indicate the following:
    - Why you're applying to the program
    - Your post-graduation career plans
    - Your intended area of specialization
4. Submit all official transcripts from previous colleges and universities. *NOTE: we do not require transcripts from Indiana University campuses.*
5. Submit three references from academic instructors and/or employers. To submit references, you will input contact information for each person on your electronic application. The reference will receive a form via email to fill out and submit electronically.
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Last updated: 3/2024

Graduate Admissions

Graduate Admissions

Applications for all graduate certificates are **May 1** for fall admission and **November 1** for spring admission. For

M.S. programs applications must be received by **January 15 (early action)** and **March 1 for fall admission (international students**) and **May 1** (**domestic students**) **August 1 (international students)** and **October 1 (domestic students) for spring admission**.

Applications for admission to the **M.L.I.S. program** must be received by **June 1 for fall admission, November 15 for spring admission** and by **March 1 for summer admission**.

Applicants to the **Ph.D. program** are only eligible for fall admission and must submit applications by **January 8** for Data Science and **January 15** for all other Ph.D. programs.

The Graduate Admissions Committee will not review applications until the application fee and all required materials are completed and received by the deadlines indicated.

Last updated: 3/2024

Admission

How to Apply: Current IU Indianapolis Students
If you are an IU Indianapolis student not currently enrolled in the Luddy School of Informatics, Computing, and Engineering, but would like to pursue an Applied Data and Information Science, Artificial Intelligence, Biomedical Informatics, Health Information Management, Informatics, Media Arts and Science, or the Full Stack Development (Informatics + Media Arts and Science) degrees, please schedule an appointment to speak with one of our advisors who can help evaluate your situation and guide you through the process.

Current Luddy School of Informatics, Computing, and Engineering Students
If you would like to change your major within the Luddy School of Informatics, Computing, and Engineering, please schedule a time to meet with your advisor to discuss your options.

Updated 4/2022

Admission

How to Apply: B.S. Health Information Administration Admissions
Students may begin the HIA Professional Program in either the fall or spring semester. Students must have all of their pre-requisite courses completed prior to starting the professional program and apply during the semester prior to their anticipated start date. Completed applications should be emailed directly to the Academic Advisor, Julie Reagan at jdreagan@iupui.edu.

Admissions Requirements and Standards
Completion of all required prerequisite courses with a grade of C or higher (C- grades are not acceptable).

A minimum IU cumulative GPA of 2.5 or higher is needed. You may complete the “Petition for Exceptional Consideration” found on the HIA application if you do not meet this requirement but still feel equipped to succeed in the HIA program. Students who seek exceptional consideration may be asked to schedule an interview. You will be contacted if this is necessary.

Note: Students looking to begin work towards the Health Information Administration degree and who have not yet been admitted to IU Indianapolis or the Luddy School of Informatics, Computing, and Engineering should choose the appropriate category from the menu provided here to find out how to apply.

Note for transfer students: Transfer students who have completed HIA professional program prerequisites through another institution must first apply and be admitted to IU Indianapolis before being considered for admission in the professional program.

Admission

How to Apply: High School and First-Time College Students
You’ll actually apply for admission online through the IU Indianapolis Office of Admissions. We encourage you to apply for **direct admission**, which allows you to enter IU Indianapolis as a Luddy School of Informatics, Computing, and Engineering student your very first semester. To pursue direct admission, you must list your intended major or certificate on your IU Indianapolis admissions application and meet eligibility criteria.

Another option is to start in IU Indianapolis’ University College, where you’ll begin taking courses, declare your major and then certify into the Luddy School of Informatics, Computing, and Engineering early in your college career. To certifiy into the Luddy School of Informatics, Computing, and Engineering from University College, you will need to have achieved the following: 2.5 gpa, 12 credits of completed coursework and a grade of C-or higher in the following courses; LIS-S201 (Applied Data and Information Science majors), AIS 10000 (Artificial Intelligence majors), INFO-I201 (Biomedical Informatics), HIM-M108 (Health Information Management majors), INFO-I101 (Informatics majors) and NEWM-N100 (Media Arts and Science majors).

But that doesn’t stop you from immediately joining one of our student groups, meeting with our advisors and becoming part of the informatics community.

Visit IU Indianapolis’ Office of Admissions to begin your application or click here to check application status.

Requirements
Please make sure to review IU Indianapolis’ admission requirements through the Office of Admissions.

For **direct admission** into the Luddy School of Informatics, Computing, and Engineering, we're looking for students with:

- Competitive grades and class rank
- All high school and first-time college students will have the option to apply without submitting test scores
- For direct admission into these majors, gpa requirements are as follows: Applied Data and Information Science, 3.0 gpa, Artificial Intelligence, 3.0 gpa, Informatics, 3.0 gpa, Media Arts and Science, 3.0, Biomedical Informatics, 3.2 gpa and Health Information Management, 3.2 gpa

Updated 4/2022

Admission

Undergraduate Admissions

We want to do everything we can to make becoming part of the Luddy School of Informatics, Computing, and Engineering family as simple and convenient as possible. Please choose the category below that applies to you to learn more about the admissions process.

- High School or First-time College Students
- Transfer Students
- Returning Students
- International Students
- Current IU Indianapolis Students

Deadlines for undergradutate admission applications can be found at IU Indianapolis' Office of Undergraduate Admissions.

Graduate Admissions
Applications for all graduate certificate and **M.S. programs** must be received by **January 15 (early action)**, **March 1 for fall admission(international students) and May 1(domestic students)** and **August 1 (international students) and October 1 (domestic students) for spring admission**.

Applications for admission to the **M.L.I.S. program** must be received by **June 1 for fall admission, November 15 for spring admission** and by **March 1 for summer admission**.

Applicants to the **Ph.D. program** are only eligible for fall admission and must submit applications by **January 15** with the exception of Data Science which has a deadlie of **January 8.**

The Graduate Admissions Committee will not review applications until the application fee and all required materials are completed and received by the deadlines indicated. Specific application details for each graduate program are available in the links located on the left navigation bar.

Last updated: 3/2024

Admission

How to Apply: International Students
International students wishing to enroll at the Luddy School of Informatics, Computing, and Engineering must first apply through the Office of International Affairs.

Further information about international admissions, including details about the many scholarships available to international students, are available through the Office of International Affairs. They offer a wealth of information in multiple languages, including Spanish, Portuguese, Arabic and Chinese.

Requirements
The Office of International Affairs maintains its own requirements for international students seeking admission to IU Indianapolis. Please visit their site to review those requirements, including English proficiency standards and what academic records and immigration documentation you will need to provide.

Updated 4/2022

Admission

How to Apply: Returning Students
Welcome home! No matter how long you've been away, it's never too late to finish your education.

If less than two semesters have passed since you left (with the exception of summer terms), please contact your academic advisor.

If you haven't enrolled in IU Indianapolis courses for one year or more, you will need to reapply (admission fee waived) through the IU Indianapolis Office of Admissions. Please refer to IU Indianapolis' dates and deadlines for returning students prior to applying for admission.

If you are a previous student of the Luddy School of Informatics, Computing, and Engineering applying for readmission, please be aware of potential curricula changes. If you've been gone less than two years, you will return to your original program curriculum. If it's been two or more years, you will be readmitted under the current curriculum.

Returning students new to the Luddy School of Informatics, Computing, and Engineering are invited to apply for admission.

Requirements
Returning students are assessed on a case-by-case basis depending upon past credits, transcripts and desired course of study. If you've been away from IU Indianapolis for two or more semesters, we encourage you to complete the reapplication process so that your situation can be reviewed by the IU Indianapolis Office of Admissions and the Luddy School of Informatics, Computing, and Engineering.

Updated 4/2022

Admission

How to Apply: Transfer Students
So you want to transfer to IU Indianapolis and the Luddy School of Informatics, Computing, and Engineering? We have to say, you've made an excellent choice!

The IU Indianapolis Office of Admissions' Transfer Central will tell you all you need to know.

- If you are transferring from another campus of Indiana University, please review the intercampus transfer process.
- If you are transferring from a college or university other than Indiana University, follow these important instructions.
- If you are an IU Indianapolis student wishing to change majors, please see the current IU Indianapolis Students page.

TransferIN is a good source to determine how your credits may transfer to IU Indianapolis from other Indiana schools, or you may contact one of our advisors. And don't forget to review IU Indianapolis' Transfer Credit Policy.

Transfer Student Information Sessions
We strongly encourage any prospective transfer students from ANY undergraduate program/school (including IU Indianapolis) to attend one of our regularly scheduled

transfer student information sessions. Our advisors will provide a comprehensive overview of the transfer process for the Luddy School of Informatics, Computing, and Engineering, including how your existing credits fit into our program curricula and what courses we recommend you take in future semesters.

Check out our undergraduate “Visit Us” page for upcoming dates and to sign up.

Requirements
Your application will be evaluated by the IU Indianapolis Office of Admissions according to IU Indianapolis’ transfer admission requirements. It will then be forwarded to the Luddy School of Informatics, Computing, and Engineering for review, at which point one of our advisors will contact you for a consultation and recommendations.

Updated 4/2022

Graduate Academic Regulations

Graduate Academic Regulations

In addition to the many topics covered below, students enrolled in the Luddy School of Informatics, Computing, and Engineering's graduate programs are encouraged to review the Graduate Academic Policies found at SOIC Graduate Academic Policies.

Applicability of Degree Requirements
Students may choose to complete either the specific degree requirements published in the appropriate bulletin at the time of entry into the university or those in the bulletin current at the time of graduation.

Residency Requirements
The campus at which a student is admitted will certify and award the degree.

Intercampus Transfer
Students enrolled in the School of Informatics at any campus of Indiana University may transfer to the School of Informatics on another campus, provided they are in good standing. However, international students may need to pay a processing fee.

Transfer of Credit
A maximum of 9 credit hours of graduate course work with grades of B (3.0) or higher may be transferred from other accredited colleges and universities and applied to the Luddy School of Informatics, Computing, and Engineering degree programs. The transfer must be approved by the dean, and is not an automatic occurrence.

Revalidation
Normally, a course may not be counted toward degree requirements if it has been completed more than five years prior to the awarding of the degree for master’s students. The advisor may recommend to the dean that course work taken prior to the deadline be revalidated if it can be demonstrated that the knowledge contained in the course(s) remains current. Currency of knowledge may be demonstrated by: (a) passing an examination specifically on the material covered by the course; (b) passing a more advanced course in the same subject area; (c) passing a comprehensive examination in which the student demonstrates substantial knowledge of the content of the course; or (d) publishing scholarly research demonstrating knowledge of the content of the course.

Courses taken while an undergraduate and counted toward the requirements of a baccalaureate degree may not also be counted toward a graduate degree.

Grading System
A minimum of a B (3.0) average in graduate work is required for continuance in graduate study. Courses completed with grades below C (2.0) are not counted toward degree requirements, but such grades will be counted in calculating a student’s grade point average. Note that no work may be transferred from another institution unless the grade is B (3.0) or higher.

Incomplete
A grade of Incomplete may be given only if the completed portion of a student’s work is of passing quality. It is the responsibility of the student to satisfy the requirements of that course within one calendar year from the date on which the Incomplete is recorded. The student is expected to finish all necessary work in time for the instructor to assign a regular grade before the expiration of this time period. If the student is unable to do so, it is the student’s responsibility to notify the instructor of the course and the graduate advisor within the year to request an extension of time. Every overdue Incomplete will be changed to a grade of F after one calendar year.

Withdrawals
Because deadlines for withdrawal from courses may vary by campus and/or school, students should check with the current campus Schedule of Classes to verify deadlines and procedures.

Course Waivers
Requests for waivers of specific courses or requirements on the basis of previous course work are to be submitted in writing to the dean.

Credit Earned in Nondegree Status
A maximum of 9 hours of graduate credit completed as a nondegree student may be credited toward a Luddy School of Informatics, Computing, and Engineering graduate degree. Deficiency courses do not apply to the 9 credit hours.

Academic Standing
Students are considered to be in good standing during any semester in which their academic grade point average is at least 3.0 (B) for both their last semester’s course work and for the cumulative average of all course work completed. Only courses with grades of B- (2.7) or above may be counted toward degree requirements. However, grades below C are used in computing the cumulative grade point average, even if a course is repeated and a higher grade is earned.

Academic Probation
Students are placed on probation following a semester in which their graduate cumulative or semester grade point average falls below 3.0. Students on probation are required to attain an average of at least 3.0 for all graduate course work completed by the end of the next semester of full-time enrollment or its equivalent (9 credit hours). Failure to do so is cause for dismissal.

Academic Integrity
Academic integrity requires that students take credit only for their own ideas and efforts. Misconduct, including cheating, fabrication, plagiarism, interference, or

facilitating academic dishonesty, is prohibited because it undermines the bonds of trust and cooperation among members of this community and between us and those who may depend on our knowledge and integrity. Complete details are contained in the Indiana University Code of Student Rights, Responsibilities and Conduct.

Thesis
Depending on particular degree requirements, students will complete either a capstone project or a thesis under the guidance of an advisor. More details are given in the appropriate section for each program.

Degree Conferral
For all students seeking a master's degree, an application for the degree must be filed with the Luddy School of Informatics, Computing, and Engineering at least 60 days before the date anticipated for degree conferral. All degree requirements must be completed at least 30 days prior to the date of expected degree conferral, including submission of the bound copies of the master's thesis (if required for degree).

Time Requirements
All requirements for M.S. degrees must be met within five consecutive calendar years from the date of completion of the first credited (i.e., nondeficiency) course.

Last updated: 4/2022

Academic Policies & Procedures

Absences

From Final Examinations
Students are required to adhere to the policies regarding final examinations as published in the *Schedule of Classes*.

From Scheduled Classes
Illness or equivalent distress is the only acceptable excuse for absence from class. Other absences must be explained to the satisfaction of the instructor, who will decide whether omitted work may be made up.

Degree Application
Candidates for graduation must file an application with the school by June 15 for December graduation and November 1 for May and February 1 for June or August graduation. Credits for all course work, except that of the current semester, must be recorded on the candidate's Indiana University transcript at least one month prior to the date of graduation.

Residency Requirement for Degree Purposes

The institution maintains structures or practices that ensure the coherence and quality of the programs for which it awards a degree. Typically institutions will require that at minimum 30 of the 120 credits earned for the bachelor's degree and 15 of the 60 credits for the associate's degree be credits earned at the institution itself, through arrangements with other accredited institutions, or through contractual relationships approved by the Commission. Any variation from the typical minima must be explained and justified.

Statute of Limitations

Candidates for the bachelor's degree in informatics have the right to complete the degree requirements specified by the bulletin in effect at the time they entered Indiana University, provided that the required courses are available and that no more than eight calendar years have elapsed since the date of entry.

Grading Policies
The Luddy School of Informatics, Computing, and Engineering follows the official grading system of Indiana University described in the front of this bulletin.
Additionally, all undergraduate Luddy School of Informatics, Computing, and Engineering students must earn a grade of C- or higher in all courses, including major, minor, and electives. The exception being for Health Information Management BS students and Medical Coding students taking HIM-M courses, the minimum grade will remain a C for those courses. Students earning lower than these requirements must meet with their academic advisor prior to the next semester's registration to discuss retaking courses.

Incomplete Grades

A grade of incomplete may be given only if the completed porition of a student's work is of passing quality. It is the responsibility of the student to satisfy the requirements of that course within one calendar year from the date on which the in complete is recorded. The student is expected to finish all necessary work in time for the instructor to assign a regular grade before the expiration of this time period. If the student is unable to do so, it is the student's responsibility to notify the instructor of the course and the graduate advisor within the year to request an extension of time. Every overdue incomplete will be changed to a grade of F after one calendar year.

A student who has received a grade of incomplete (I) should not register for the course a second time, but should arrange with the instructor to have the incomplete (I) changed to a letter grade upon completion of all requirements.

Additional Semester Policy Information

For additional policy information, please access post Auto W.

Pass/Fail

During an undergraduate program, students in the Luddy School of Informatics, Computing, and Engineering in good standing (not on probation) may enroll in up to a maximum of eight university elective courses to be taken with a grade of P (pass) or F (fail). Students may take up to two Pass/Fail courses during an academic year. The procedure for declaring this option may be found in the Schedule of Classes. A grade of P is not counted in the grade point average; a grade of F is included. Grades of P cannot be changed to any other letter grade.

Probation/Dismissal/Readmission for Undergraduate Students of the IU School of Informatics and Computing

Academic Warning
A student whose semester (fall or spring) grade point average (GPA) falls below a 2.0, but whose cumulative GPA is a 2.0 or higher will be placed on academic warning. An advising hold will be placed on the student's

record and the student will be required to meet with their academic advisor prior to registration.

Academic Probation
A student whose cumulative grade point average (CGPA) falls below a 2.0 or has two consecutive semesters (fall and spring) with a GPA below a 2.0 will be placed on probation for the subsequent semester. A probation hold will be placed on the student's record and the student will be required to meet with their academic advisor prior to registration. Probation will be removed if the cumulative GPA reaches 2.0 or higher or if the semester GPA reaches 2.0 or higher, if the cumulative GPA is already at 2.0 or higher.

Dismissal
A student on probation who has completed a minimum of 12 IU GPA hours is subject to dismissal upon failing to attain a GPA of at least 2.0 in any two consecutive semesters (fall and spring) and the student's cumulative IU GPA is below 2.0.

First--#Semester Student Dismissal
A first--#semester student who has attempted a minimum of 12 IU GPA hours is subject to dismissal upon failing to attain a GPA of at least 1.0 in the student's first semester in the Luddy School of Informatics, Computing, and Engineering.

Readmission
Students who are dismissed for the first time must sit out for a minimum of one regular (fall or spring) semester and petition by the established deadlines to be eligible for readmission. Students dismissed two or more times must remain out of school for two regular (fall and spring) semesters and petition by the established deadlines to be eligible for readmission. Readmitted students may only begin in either the fall or spring semester.

Grade Replacement
The Grade Replacement Policy is available only to undergraduate students. It may be exercised for a maximum of 15 credit hours, no more than two times for a given course, with each attempted replacement counting toward the 15 credit hour limit. Any grade may be replaced with the last grade earned for the course, as long as the most recent grade is equal to or higher than the grade being replaced. The replaced grade will then be excluded from the cumulative grade point average. However, the course listing and the replaced grade will remain on the student's academic record with an "X" notation indicating that the grade is excluded from the cumulative grade point average.

The policy became effective beginning with the fall 1996 semester, and any courses being used to replace an earlier grade must have been taken in the fall of 1996 or later. Grades previously granted FX will be honored and will count toward the 15 credit hour limit. Once invoked, a student may not subsequently request reversal of the grade replacement granted for a given course. Also, this policy is not available for graduate students or students seeking any second undergraduate degree. Please see your academic advisor to discuss grade replacement and obtain a form. For more information about the policy, click here.

Last updated: 4/2022

Human-Computer Interaction Certificate

Human-Computer Interaction Certificate

Human-computer interaction focuses on the user experience. It's the branch of informatics charged with developing technology that's empowering, inherently usable, and socially relevant.

Human-centered computing draws from the human and the machine sides of the equation. Computer graphics, operating systems, and development strategies are all relevant. So are communication theory, graphic and industrial design disciplines, linguistics, social sciences, cognitive psychology, and user satisfaction.

Certificate Requirements
The Undergraduate Certificate in Human-Computer Interaction (HCI) is a 15-credit-hour program allowing students to become certified in the fundamental theory and application of human-computer interaction.

- INFO-I 270 Introduction to HCI Principles & Practices(May count towards the Social Sciences General Education Requirement)
- INFO-I 275 Introduction to HCI Theory (May count towards the Social Sciences General Education Requirement)
- INFO-I 300 Human-Computer Interaction
- NEWM-N 450 Usability Principles for New Media Interfaces

Choose one:

- NEWM-N 328 Visualizing Information
- INFO-I 467 Internet-of-Things Interface Design for Business Innovation
- INFO-I 480 Experience Design and Evaluation of Ubiquitous Computing
- INFO-I 481 Experience Design and Evaluation of Access Technologies (online option available)
- INFO-I 482 Assistive Technology (online option available)
- INFO-I 483 Conversational User Interfaces: Experience Design and Applications (online option available)

Students must earn a C- or higher in each course and maintain a 2.0 GPA to graduate.

Last updated: 3/2024

Undergraduate Certificate Programs

Undergraduate Certificate Programs

Prior to each semester's enrollment, a faculty member or an academic advisor provides academic counseling for each student in the Luddy School of Informatics, Computing and Engineering. Although academic counseling is intended to provide effective guidance, students are responsible for planning their own programs and for meeting the following degree requirements for graduation.

Students are advised to read bulletin descriptions of all courses selected, paying careful attention to conditions concerning awarding of credit.

The Luddy School of Informatics, Computing and Engineering offers the following undergraduate certificates:

- Applied Data Science
- Applied Information Science
- Artificial Intelligence
- Human-Computer Interaction
- Legal Informatics
- Medical Coding
- Multi-Device Development
- Software Bots for Cognitive Automation
- Post Baccalaureate Certificate in Health Information Management
- Virtual Production

Legal Informatics Certificate

Legal Informatics Certificate

Legal Informatics has been described as “the study of the application of information technologies to the field of law and the use of these technologies by legal professionals.” Therefore, the focus of the Certificate in Legal Informatics is on the effective use of cutting-edge technology in the study and practice of law. Legal informatics also includes the law related to technology, such as intellectual property law, and security. All of the courses for the Certificate in Legal Informatics are offered online.

Certificate Requirements
The following five (5) courses comprise the Certificate in Legal Informatics, for a total of 15 credit hours:

- INFO I330 Legal and Social Informatics of Security (3 cr.)
- INFO I350 Foundations in Legal Informatics (3 cr.)
- INFO I410 Electronic Discovery (3 cr.)
- INFO I470 Litigation Support Systems and Courtroom Presentation (3 cr.)
- NEWM N480 Technology and the Law (3 cr.)

Students who complete all five courses as part of their undergraduate degree will earn a Certificate in Legal Informatics. Students can also earn the Certificate in Legal Informatics as a free-standing certificate. Students must earn a C- or higher in all five courses in order to qualify for the Certificate in Legal Informatics.

Last updated: 3/2024

Medical Coding Certificate

Medical Coding Certificate

The Medical Coding Certificate is a 28-credit-hour program focusing on pathophysiology, pharmacology, coding, medical reimbursement and basic concepts of health information and is designed to better prepare you to sit for industry standard certifications.

The curriculum includes a unique professional practicum component that integrates classroom instruction with applied, technical experience in an actual healthcare facility.

Credit earned for the certificate may be applied toward a bachelor’s degree in Health Information Management (application and acceptance into the HIM program required). Graduates are also eligible to seek the Certified Coding Associate (CCA) credential offered by the American Health Information Management Association (AHIMA).

Admission and Requirements
Prospective students must first be admitted to IU Indianapolis as an undergraduate student. You must also acquire knowledge of anatomy, physiology and database design through the completion of designated prerequisites with a minimum grade of C (2.0). Students must achieve a minimum cumulative G.P.A. of 2.5 to begin courses.

Prerequisites (12 cr.)
- BIOL N207 Physiology for Health Care Management (3 cr.)
- BIOL N211 Anatomy for Health Care Management (3 cr.)
- HIM M110 Computer Concepts for Health Information (3 cr.)
- HIM M330 Medical Terminology (3 cr.)

Required Courses (28 cr.)
- HIM M325 Healthcare Information Requirements and Standards (3 cr.)
- LIS-S301 Data Policy and Governance (3 cr.)
- HIM M350 Pathophysiology & Pharmacology for HIM I (3 cr.)
- HIM M355 ICD-10-CM/PCS Coding (3 cr.)
- HIM M351 Pathophysiology & Pharmacology for HIM II (3 cr.)
- HIM M358 CPT Coding (3 cr.)
- HIM M345 Medicine, Law, and ROI (3 cr.)
- HIM M470 Healthcare Reimbursement Systems (3 cr.)
- HIM M457 Practicum in Medical Coding (4 cr.)

Last updated: 3/2024

Applied Data Science Certificate

Applied Data Science Certificate

You’ll learn to develop data-driven solutions, allowing us to better understand ourselves, our communities, and the global market. Unlocking the power of data enables us to run businesses more efficiently, make groundbreaking scientific discoveries, and promote the common good.

When you earn the applied data science certificate you will develop mathematical and technological skills to analyze data sets, leading to valuable knowledge. You’ll also learn about the societal implications of data work, including privacy and surveillance.

Certificate Requirements
Required Courses (24 cr.)

- LIS-S 202 Data Organization and Representation (3 cr.)
- INFO-I 415 Introduction to Statistical Learning (3 cr.)
- Statistics: PBHL-B 302 (or alternative ECON-E 270 Introduction to Statistical Theory in Economics and Business (3 cr.), PBHL-B 300 Introduction to Biostatistics (3 cr.), SPEA-K 300 Statistical Techniques (3 cr.), STAT 30100 Elementary

Statistical Methods 1 (3 cr.), or STAT 35000 Introduction to Statistics (3 cr.))
- Programming course: INFO-B 210 Information Infrastructure I (4 cr.) (or alternative or CSCI-A 204 Intro to Programming or CSCI 23000 Computing I)
- Database course: INFO-I 308 Information Representation (3 cr.) (or alternative or CSCI-N 211 Introduction to Databases (3 cr.) or CSCI 44300 Database Systems (3 cr.)

Choose three from this list:

- INFO-I 418 Deep Learning Neural Networks (3 cr.)
- INFO-I 428 Web Mining (3 cr.)
- INFO-B 443 Natural Language Processing (3 cr.)
- NEWM-N 328 Visualizing Information (3 cr.)
- INFO-I 416 Cloud Computing for Data Science (3 cr.)

A C- or higher is required for all courses. Students must maintain a 2.0 GPA.

Last updated: 3/2024

Applied Data Science Certificate

Applied Data Science Certificate

You'll learn to develop data-driven solutions, allowing us to better understand ourselves, our communities, and the global market. Unlocking the power of data enables us to run businesses more efficiently, make groundbreaking scientific discoveries, and promote the common good.

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- Programming course: INFO-B 210 Information Infrastructure I (4 cr.) (or alternative or CSCI-A 204 Intro to Programming or CSCI 23000 Computing I)
- Database course: INFO-I 308 Information Representation (3 cr.) (or alternative or CSCI-N 211 Introduction to Databases (3 cr.) or CSCI 44300 Database Systems (3 cr.)

Choose three from this list:

- INFO-I 418 Deep Learning Neural Networks (3 cr.)
- INFO-I 428 Web Mining (3 cr.)
- INFO-B 443 Natural Language Processing (3 cr.)
- NEWM-N 328 Visualizing Information (3 cr.)
- INFO-I 416 Cloud Computing for Data Science (3 cr.)

A C- or higher is required for all courses. Students must maintain a 2.0 GPA.

Last updated: 3/2024

Post Bacc Health Information Management Certificate

Post Baccalaureate Certificate in Health Information Management

Expand your options by earning Indiana University's Post-Baccalaureate Certificate in Health Information Management (HIM). You could qualify to enter the profession in as few as 27 credit hours, depending on your educational background and work experience.

The HIM program at IU is one of the first and longest running in the nation, with more than 90% of its graduates hired in the profession.

Certificate Requirements

The length of the program depends on your prior coursework and experience. The **certificate's requirements are 66 credit hours**.

However, if you have a bachelor's degree in the biological or health sciences, or are enrolled in a health-related dual degree, **you could finish this certificate in as few as two semesters** (27 credit hours minimum).

Required Courses

- - BIOL-N 207 Physiology for Healthcare Management (online)
  - BIOL-N 211 Anatomy for Healthcare Management (online)
  - HIM-M 110 Computer Concepts for Health Information (online and on campus)
  - HIM-M 200 Database Design for Health Information Management (online and on campus)
  - HIM-M 220 Healthcare Informatics for Decision Support (online and on campus)
  - HIM-M 275 Cultural Competence in Healthcare Communication (online and on campus)
  - HIM-M 325 Healthcare Information Requirements and Standards I (online and on campus)
  - HIM-M 330 Medical Terminology (online and on campus)
  - HIM-M 345 Healthcare Law, Ethics, and Information Release (online and on campus)
  - HIM-M 350 Pathophysiology and Pharmacology for HIM I (online and on campus)
  - HIM-M 351 Pathophysiology and Pharmacology for HIM II (online and on campus)
  - HIM-M 355 ICD-10-CM/PCS Coding (online and on campus)
  - HIM-M 358 CPT Coding (online and on campus)
  - HIM-M 370 Health Information Management (online and on campus)
  - HIM-M 400 Health Information Research and Analysis Methods (online and on campus)

- HIM-M 420 Health Information Project Management (online and on campus)
- HIM-M 425 Quantitative Analysis of Health Information (online and on campus)
- HIM-M 462 Healthcare Quality Improvement (online and on campus)
- HIM-M 470 Healthcare Reimbursement Systems (online and on campus)
- HIM-M 475 Health Information Technology (online and on campus)
- HIM-M 490 RHIA Exam Preparation (online and on campus)
  Choose one:

- PBHL-B 301 Biostatistics for Health Information Management or
- PBHL-B 302 Biostatistics for Informatics

A C- or higher is required for all courses. Students must maintain a 2.0 GPA.

Last updated: 3/2024

Multi Device Development Certificate

Multi-Device Development Certificate

You know mobile devices are integral to our lives. In just 16 weeks, you can be developing mobile and desktop applications when you earn a Multi-Device Development certificate from Indiana University through our school.

Our boot camp-style program equips you with the skills for an entry-level job creating client-side websites and web and mobile applications. It's ideal for recent high school graduates and adult learners.

This 18-credit-hour certificate is quick and affordable … and you can earn it entirely online. Also, unlike other boot camp programs**, every credit you earn with this certificate can apply toward a bachelor's degree**.

Certificate Requirements (18 cr.)

Required Courses

- NEWM-N 115 Introduction to Multi-Device Web Development
- NEWM-N 215 Intermediate Multi-Device Web Development
- NEWM-N 220 Media Application Development
- NEWM-N 315 Advanced Multi-Device Web Development
- NEWM-N 320 Intermediate Media Application Development
- NEWM-N 322 Dynamic Data Applications
- NEWM-N 423 Database Development for Mobile Applications

Our **16-week intensive boot camp** gets you into the job market fast. You can earn your certificate in desktop and mobile device development entirely online, making it easy to fit into your schedule.

You should expect to spend 3-5 hours per day on coursework during the boot camp experience.

Your first 4 weeks

NEWM-N 115 Intermediate Multi-Device Web Development
Work with content management systems and gain insights into Web publishing, and how to prepare, manage, and organize media online.

Weeks 5-8

NEWM-N 215 Intermediate Multi-Device Web Development
Work with content management systems and gain insights into Web publishing, and how to prepare, manage, and organize media online.

Weeks 9-10

NEWM-N 315 Advanced Multi-Device Web Development
In these two weeks you'll delve into advanced creation, publication, and management of media-rich, interactive publications for online distribution.

Weeks 11-12

NEWM-N 320 Intermediate Media Application Development
Explore intermediate-level skills for design of interactive multimedia applications for desktop and mobile devices. Use industry-standard tools to create applications emphasizing animation and interactivity.

Weeks 13-14

NEWM-N 322 Dynamic Data Applications
You'll immerse yourself in the techniques of creating multi-media applications.

Weeks 15-16

NEWM-N 423 Database Development for Mobile Applications
Your final two weeks will cover the development of mobile applications, and methods for securely storing and retrieving data.

A C- or higher is required for all courses. Students must maintain a 2.0 GPA.

Last updated: 3/2024

Software Bots Certificate

Software Bots for Cognitive Automation Certificate

Machine learning and artificial intelligence are transforming industries, and common tasks like processing invoices and screening job applicants. Seize the opportunities these rapidly evolving technologies are creating.

Our Software Bots for Cognitive Automation certificate online and prepare to join the AI workforce and qualify for technology careers in sectors including:

- Retail
- Health care
- Banking and finance
- Logistics
- Manufacturing
- Agriculture

Certificate Requirements (16 cr.)

You'll take five online classes to earn your 16-credit Software Bots for Cognitive Automation Undergraduate Certificate.

Core Courses

1. Python Programming: CSCI-A 201 Intro to Programming I or INFO-B 210 Information Infrastructure I
2. **INFO-I 220** Social Impact of Bots and Automation
3. **INFO-I 319** Cognitive Automation and Bots Development
4. **INFO-I 419** Enterprise Cognitive Automation
5. **Approved Elective**

Select one:

- AII 20000 Introduction to Data Science (3 cr.)
- CSCI-A 202 Introduction to Programming II (4 cr.)
- CSCI-N 211 Introduction to Databases (3 cr.)
- HIM-M 200 Database Design for Health Information Management (3 cr.)
- INFO-B 443 Natural Language Processing (3 cr.)
- INFO-I 223 Data Fluency (3 cr.)
- INFO-I 308 Information Representation (3 cr.)
- INFO-I 340 Collaborative Human–AI Systems (3 cr.)
- INFO-I 428 Web Mining (3 cr.)
- INFO-I 459 Media and Technology Entrepreneurship (3 cr.)
- INFO-I 483 Conversational User Interfaces: Experience Design and Applications (3 cr.)
- INFO-I 496 Artificial Intelligence Professional Practice 1 (3 cr.)
- NEWM-N328 Visualizing Information (3 cr.)

A minimum grade of C- is required for any course to be counted toward the certificate.

last updated: 3/2024

Virtual Production Certificate

Virtual Production Certificate

Virtual production empowers filmmakers, actors, and animators across multiple locations to collaborate in real time. They create together by using software tools to combine live-action footage with computer-generated graphics.

Virtual production has become integral to filmmaking. Studios need talent with a solid understanding of this new field in digital cinema.

Gain in-demand skills by earning our undergraduate certificate in virtual production. You'll learn the software and equipment used to create virtual sets and reactive backgrounds in real time.

Certificate Requirements (18 cr.)

You earn our 18-credit-hour undergraduate certificate in virtual production by taking the following courses over two years:

- NEWM-N 230 Introduction to Game Design and Development
- NEWM-N 243 Introduction to 3D
- NEWM-N 253Introduction to Digital Video
- NEWM-N 330 Intermediate Game Design and Development
- NEWM-N 356 Lighting and Field Production
- NEWM-N 458 Beyond the Frame: New Forms of Video Production

A minimum grade of C- is required for any course to be counted toward the certificate.

last updated: 3/2024

Applied Info Data Science Certificate

Applied Information Science/Data Studies Certificate

You can learn to understand and manage the data we create, consume, and interact with daily, when you earn an Applied Information Science/Data Studies Certificate from Indiana University through the Luddy School of Informatics, Computing and Engineering in Indianapolis.

Can't wait to get started? You have the option to earn this 18-hour certificate entirely online, through our quick and affordable Online Data Boot Camp. This is a convenient option for recent high school graduates and adult learners.

Unlike other boot camp programs, you can apply every credit you earn with this certificate toward a bachelor's degree.

Certificate Requirements (18 cr.)

- LIS-S 201 Foundations of Data Studies
- LIS-S 202 Data Organization and Representation
- LIS-S 301 Data Policy and Governance
- LIS-S 305 Data Curation and Management
- INFO-I 308 Information Representation *****
- INFO-I 415 Introduction to Statistical Learning *****

Note: All courses are asynchronous, except those denoted with ***** have synchronous labs.

Students must earn a C- or higher in each course and maintain a 2.0 GPA to graduate with the Data Studies certificate. All required courses are available online.

last updated: 3/2024

Artificial Intelligence

Bachelor of Science in Biomedical Informatics

Bachelor of Science in Biomedical Informatics

The Biomedical Informatics Bachelor of Science degree is aimed at students who have an introductory background in both computing and biology. The 120-credit-hour program integrates knowledge from health, information systems, biomedical science, and other related areas.

Upon enrolling in the program, you'll select a specialty: bioinformatics, digital health, health informatics, or premedical bioinformatics. From there, we'll help you to select classes that will elevate your skills in these and other disciplines.

Biomedical Informatics with a Bioinformatics specialization

Data can become an agent for change only when we have the ability to retrieve and organize it. Turn bio-repositories into tools for research and resources for

developing precision medicine. Learn how to utilize genomic, molecular, and patient data to diagnose and treat rare diseases, reduce harmful drug interactions, and repurpose FDA-approved drugs.

Bioinformatics is changing how decisions are made, with focused analysis that redefines clinical practice. Effectively managing the results of experiments using high-throughput technology is crucial to drug research, and genomic and protein sequencing.

Biomedical Informatics with a Digital Health specialization

Use digital tools to provide care for patients, using remote technology. Students learn how to design these tools; develop technology and programs for analyzing digital data; and build and manage systems to deliver care to patients. This new field is experiencing high rates of growth, offering great opportunities for a rapidly advancing career.

Biomedical Informatics with a Premedical Bioinformatics specialization

This course of study focuses on the same areas of expertise as the bioinformatics specialization. It includes all courses required for medical school at Indiana University and most other universities.

Biomedical Informatics with a Health Informatics specialization

Each of us intersects with the world of health care. It may be as a diagnostician, researcher, lab technician … and, almost surely at some point, as a patient.

Learn to solve real-world problems in computational biology using informatics. Specializing in health informatics means you'll develop skills to enhance research, and to improve both the security of our electronic medical records and the ways we obtain care.

Standardizing data and how we retrieve it has far-reaching implications. Health informatics allows us to access and monitor our own health information, and aids researchers in detecting trends to contain outbreaks of disease.

Capstone Project
During the senior year, students culminate their course studies through practical application of concepts and practices working in industry. Course requires prior authorization and approval of internship through the Luddy Career Services Office. Required coursework is completed via Canvas.

Last updated: 3/2024

Computer Science
Immerse yourself in the future of computing

By earning a computer science degree, you'll learn how to understand, design, and create next-generation human-centered computing systems–the kind you'd like to use.

Whether solving problems or designing systems, Luddy Indianapolis puts human needs and abilities first while putting you in control of your education:

Forget about one size fits all
Every student comes to our program with a different level of knowledge. We offer options that allow you to learn at your pace and get up to speed.

Available beginning in fall 2024 from Luddy Indianapolis.

Degree options

Students can earn a bachelor of arts or a bachelor of science degree in computer science. Both degrees qualify students for the same types of jobs.

Bachelor of Arts

The B.A. has a world languages requirement and an additional writing course. It also has an area of specialization that could be any minor or certificate on campus.

Bachelor of Science

Includes calculus to prepare for certain advanced courses like deep learning and for the data science M.S. and Ph.D. The B.S. also requires computing-related courses.

What you'll learn

- Programming
- Data structures
- Discrete structures
- Computer architecture
- Algorithms and theory of computation

Customize your degree by exploring what interests you, including:

- Operating systems
- Software engineering
- Programming languages
- Computer networks
- Cybersecurity

Certifications

Individual courses help prepare students for industry certification tests.

5 year B.S. + M.S.

- Applied Data Science
- Computer Science
- Human-Computer Interaction

Bring your passion to your degree

Customize your course of study to focus on what interests you. Luddy Indianapolis makes it easy to specialize your computer science degree, so you can explore:

- Cognitive automation
- Data science
- Full-stack development
- Game development
- Human-computer interaction
- Information science
- Legal informatics

And more.

last updated: 3/2024

Five Year Bachelor's and Master's Program

Five Year Bachelor's and Master's Program
A fast track to future success!

The Luddy School of Informatics, Computing, and Engineering also offers the following innovative, accelerated 5-year B.S./M.S. degree programs in the following areas:

- B.A. Artificial Intelligence + M.S. Applied Data Science
- B.S. Computer Science + M.S. Applied Data Science
- B.S. Computer Science + M.S. Computer Science
- B.S. Data Science + M.S. Applied Data Science
- B.S. Data Science + Master of Library and Information Science
- B.S. Health Information Management + M.S. Health Informatics
- B.S. Informatics + M.S. Applied Data Science
- B.S. Informatics + M.S. Bioinformatics
- B.S. Informatics + M.S. Health Informatics
- B.S. Informatics + M.S. Human-Computer Interaction
- B.S. Informatics + Master of Jurisprudence
- B.S. Mathematics + M.S. Applied Data Science
- B.S. Media Arts & Science + M.S. Human-Computer Interaction
- B.S. Media Arts & Science + Master of Library and Information Science
- B.S. Biology + M.S. Bioinformatics
- B.S. Biomedical Informatics + M.S. Bioinformatics
- B.S. Biomedical Informatics + M.S. Health Informatics
- B.S. Health Sciences + M.S. Health Informatics
- B.S. Nursing + M.S. Health Informatics
- B.S. Sports Management + M.S. Applied Data Science with Sports Analytics specialization

Informatics and computing professionals are in constant demand within an ever-evolving and growing field. As a result, employers are seeking graduates with the highest qualifications and skill sets to emerge as tomorrow's technology leaders. With these needs in mind, the Luddy School of Informatics, Computing, and Engineering at IU Indianapolis offers four, for top-achieving and motivated students.

These forward-thinking programs combine our very best degree offerings in an accelerated format designed to prepare highly-skilled, marketable and successful graduates. Alumni of our BS+MS programs will be well-equipped not only for success in the computing and information technology fields, but also the healthcare, science, business, interactive media and design industries, among others. Key benefits of our five-year BS +MS degree programs include:

- Save time and tuition
- Stand out in the job market with advanced skills and education
- Increased lifetime earning potential

Last updated: 3/2024

Bachelor of Science in Health Information Management

Bachelor of Science in Health Information Management

The Health Information Management Bachelor of Science is a 120 credit hour program. Students must earn a C or higher in all courses and maintain a cumulative grade of 2.0 or higher to graduate.

You'll then want to meet with an undergraduate advisor to review your plan of study. The program is evenly split between pre-professional coursework and professional program coursework which is normally completed during the junior and senior years.

The Professional Program
Students may begin the HIM Professional Program in either the fall or spring semester. Students must have all of their pre-requisite courses completed prior to starting the professional program. Upon successful completion of the professional program students are eligible to sit for the internationally recognized Registered Health Information Administrator (RHIA) credential.

The Professional Practicum Experience
Our program offers one-of-a-kind experiential learning that gives you a distinct advantage as you begin your career. Students will experience a mentored professional practicum within a variety of healthcare related settings. Practicums are project-based allowing students to integrate classroom based knowledge in a real world setting solving real world problems.

Last updated: 04/23/2018

Undergraduate Programs

Undergraduate Degree Programs
Prior to each semester's enrollment, a faculty member or an academic advisor provides academic counseling for each student in the Luddy School of Informatics, Computing and Engineering. Although academic counseling is intended to provide effective guidance, students are responsible for planning their own programs and for meeting the following degree requirements for graduation.

Students are advised to read bulletin descriptions of all courses selected, paying careful attention to conditions concerning awarding of credit.

The Luddy School of Informatics, Computing, and Engineering offers the following undergraduate degrees:

- Artificial Intelligence (B.A. and B.S.)
- Biomedical Informatics
- Computer Science
- Data Science
- Health Information Management
- Informatics

- Media Arts and Science

Last updated: 3/2024

Bachelor of Science in Informatics

Bachelor of Science in Informatics

To pursue a degree in Informatics, you must first apply and be accepted to IU Indianapolis.

You'll then want to schedule time with one of our undergraduate advisors to review your plan of study and get enrolled in I101 Introduction to Informatics.

I101 Introduction to Informatics is an interactive course using lecture, guest speakers and applied projects to:

- Explore the broad impact of informatics across disciplines
- Build your programming, database and structured query language (SQL) skills
- Identify career and graduate school opportunities
- Introduce you to possible areas of specialization

Area of Specialization
An area of specialization is an integrated program of courses concentrating on the applications – and impact – of informatics within the context of another discipline. Choosing an area of specialization is required, and you may select from virtually any IU Indianapolis program to best customize your degree to your career interests. The most popular specializations include:

- 3D Graphics and Animation
- Applied Data Science
- Biology
- Business
- Computer Information Technology
- Computer Science
- Data Studies
- Digital Humanities
- Game Design and Development
- Health Information Management
- Human-Computer Interaction
- Legal Informatics
- Media Arts and Science
- Pre-Med

Capstone Project
From there, you'll complete specialized, hands-on courses that give you the tools and techniques needed as a future computing and technology professional. This includes completion of a capstone project during your senior year.

The capstone represents the culmination of your skills and knowledge within informatics and your chosen area of specialization. It may take the form of a thesis, a research project, a for-credit internship or an applied learning project to develop an information system.

Career Development
And before you graduate, you'll work with our Career Services Office to learn how to job search, assemble a portfolio of your work, pursue internship opportunities and connect with employers.

- Plan of Study
- Areas of Specialization
- Learning Outcomes

Last updated: 04/24/2018

Bachelor of Science in Informatics Areas of Specialization

Bachelor of Science in Informatics Areas of Specialization

In addition to taking Informatics courses that address the human and technical dimensions of information technology, students select an area of specialization in order to complete an Informatics degree.

An area of specialization is an integrated program of courses concentrating on the applications—and impact—of informatics within the context of another discipline. Choosing an area of specialization is required, and you may select from virtually any IU Indianapolis program to best customize your degree to your career interests. The most popular specializations include:

- 3D Graphics and Animation
- Applied Data Science
- Biology
- Business
- Computer Information Technology
- Computer Science
- Data Studies
- Digital Humanities
- Game Design and Development
- Health Information Management
- Human-Computer Interaction
- Legal Informatics
- Media Arts and Science
- Pre-Med

Choosing an area of specialization is required; most students have done so by the beginning of sophomore year. Although the areas listed above are the most popular, you may select approved minors or certificates from other IU Indianapolis programs not listed here. If you are a new student or want more information on an Informatics major with a unique area of specialization, please contact your advisor.

Last updated: 04/24/2018

Bachelor of Science in Media Arts and Science

Bachelor of Science in Media Arts and Science

To pursue a degree in Media Arts and Science, you must first apply and be accepted to IU Indianapolis.

You'll then want to sit down with one of our undergraduate advisors to review the program's plan of study and find out what courses to take.

You'll likely start with N100 Foundations of New Media, where you'll be introduced to the evolution of digital media and begin exploring your particular interest areas with hands-on projects.

Specialty Areas
From there, you'll take additional core courses and electives in your chosen specialty area(s), becoming

fluent in the use of contemporary media tools and project management principles. A specialty area is your opportunity to customize your education in those aspects of media and production best-suited for your career goals. Specialty areas include:

- 3-D Graphics and Animation
- Digital Storytelling
- Game Design and Development
- Video Production and Sound Design
- Web Design and Development

Learn more about our specialty areas.

Capstone Project
With your skills sets firmly in place, you'll design and complete a faculty-mentored capstone project during your final semester. Your capstone project signals your readiness to graduate and represents the culmination of your knowledge and skill within your chosen specialty area(s).

And as a graduating senior, you'll showcase that education and passion to your fellow classmates, family, faculty, alumni and visiting employers during the School of Informatics and Computing Capstone Event held at the close of each semester.

Learn more about upcoming Capstone Events you can attend, as well as examples of past student capstones.

Last updated: 04/23/2018

Informatics Minor

Informatics Minor

With this minor you'll be positioned to:

- Design better information systems
- Use digital technology more effectively at work
- Integrate new and updated computing applications into your specialty

Your courses will introduce you to the basic concepts of software architecture and provide you with practical experience in application development.

Plan of Study
Students must earn a C- or higher in each individual course as well as a cumulative grade point average of a 2.0 or higher in order to graduate with the Informatics minor.

Required Courses (12 cr.)
- **INFO I101 Introduction to Informatics** (4 cr.)
- INFO I210 Information Infrastructure I (4 cr.)
- INFO I211 Information Infrastructure II (4 cr.)

Additional Requirements (9 cr.)
Choose three courses.

Any INFO-I course

Or select from the following New Media classes which are taken as part of the Informatics BS.

NEWM-N220 Introduction to Media Application Development

NEWM-N320 Intermediate Media Application Development

NEWM-N328 Visualizing Information

NEWM-N450 Usability Principles for New Media Interfaces

Last updated: 3/2024

3D Graphics and Animation Minor

3D Graphics and Animation Minor

The undergraduate minor in 3D Graphics and Animation enables students to design, model, texture, animate, light, and render 3D computer animated creatures, characters, props, scenery, and artifacts. Students learn the process from preproduction, to production, to postproduction for films, videogames, environments, motion graphics, commercial graphics, visual stories, scientific simulation, 3D printing, and virtual and augmented reality. Students develop production quality projects with advanced aesthetics using the entire 3D production pipeline.

Plan of Study

Prerequisite

The minor requires knowledge of Adobe Photoshop, which may be demonstrated by test, portfolio, credential, or by taking a course that covers Photoshop, such as NEWM N102 Digital Media Imagery.

Required Courses (15 cr.)

- NEWM N243 Introduction to 3D (3 cr.)
- NEWM N341 Lighting and Materials (3 cr.)
- NEWM N343 Hard Surface 3D Modeling (3 cr.)
- NEWM N345 Organic Modeling and Texturing (3 cr.)
  - and choose one:
- NEWM N342 3D Animation (3 cr.) or
- NEWM-N340 Motion Graphics (3 cr.)

Students must earn a C- or higher in each course to graduate with the 3D Graphics and Animation minor.

Admissions and Advising

The minor is open to IU Indianapolis students in any major except Media Arts and Science. Media Arts and Science students may pursue the 3D Graphics and Animation specialization instead.

Last updated: 3/2024

Digital Humanities Minor

Digital Humanities Minor (16 cr.)

Offered jointly by the School of Liberal Arts, Herron School of Art and Design, and the Luddy School of Informatics, Computing, and Engineering in Indianapolis, this minor guides students in employing visual communication and informatics in the arts, social sciences, and humanities.

You'll learn to understand technology not as a thing apart, but as a part of our creative culture. Through this minor, students have the opportunity to view the technologies they use as objects of humanistic and artistic design,

laden with historical and cultural perspectives that interact with political and economic systems.

This experience with digital technologies and humanistic thinking expands your opportunities in today's highly interconnected global environment, as you learn to work with large data sets and perform data analysis on texts.

Minor Requirements

Required Courses (10 cr.)

- HIST-H 195 Introduction to Digital Humanities (3 cr.)
- HER-F 130 Studio Art and Technology (3 cr.)
- INFO-I 101 Introduction to Informatics (4 cr.)

HIST-H 195 is approved for the Arts and Humanities component of the General Education core. INFO-I 101 is approved for the Analytical Reasoning, List B, component of the General Education core.

Elective Courses (6 cr.)

Select two courses from outside your major:

Humanities

- AMST-A 303 American Cyber Identity (3 cr.)
- COMM-M 150 Mass Media and Society (3 cr.)
- COMM-M 215 Media Literacy (3 cr.)
- ENG-W 315 Writing for the Web (3 cr.)
- ENG-W 318 Finding Your E-Voice (3 cr.)
- ENG-W 412 Literacy and Technology (3 cr.)
- GEOG-G 337 Cartography and Graphics (3 cr.)
- GEOG-G 439 Seminar in Geographic Information Science (3 cr.)

Informatics and Information Science

- INFO-I 210 Information Infrastructure (4 cr.)
- INFO-I 223 Data Fluency (3 cr.)
- INFO-I 270 Introduction to Human-Computer Interaction: Principles and Practices (3 cr.)
- INFO-I 421 Applications of Data Mining (3 cr.)
- LIS-S 223 Genealogy and Local History Resources (3 cr.)
- LIS-S 282 Digital Preservation (3 cr.)
- LIS-S 303 Organization and Representation of Knowledge and Information (3 cr.)
- LIS-S 321 Humanities Information (3 cr.)
- LIS-S 352 Digital Libraries (3 cr.)

Media Arts

- NEWM-N 115 Introduction to Multi-Device Web Development (3 cr.)
- NEWM-N 202 Digital Storytelling (3 cr.)
- NEWM-N 253 Introduction to Digital Video (3 cr.)
- NEWM-N 243 Introduction to 3D (3 cr.)
- NEWM-N 343 Hard Surface 3D Modeling (3 cr.)
- NEWM-N 449 3D Prototyping for Visualization and Abstraction (3 cr.)

Students must earn a C- or higher in each course and maintain a 2.0 GPA to graduate with the Digital Humanities minor.

last updated: 3/2024

Game Design and Development Minor

Game Design and Development Minor

Learn the process of creating mobile, console, virtual reality, board, and video games.

Our goal-driven game development program is focused on completing play-ready products. Be prepared for a hands-on experience that will draw on all your skills — creative, managerial, technical — to conceptualize and prototype games. Deepen your understanding of cognitive theory and the psychology behind games as you combine formal and engaging elements of video game design to build interactive levels, environments, and experiences.

Minor Requirements

Introductory Course (3 cr.)

- NEWM-N 132 Game Design Psychology: Theory and Prototyping (3 cr.)

3D Graphics or Programming Course (3–4 cr.)

Select one of the following courses:

- NEWM-N 243 Introduction to 3D (3 cr.)
- CGT 11600 Geometric Modeling for Visualization and Communication (3 cr.)
- CSCI 23000 Computing I (4 cr.)
- CIT 21500 Web Programming (3 cr.)
- INFO-I 210 Information Infrastructure I (4 cr.)
- INFO-B 210 Information Infrastructure I (4 cr.)
- NEWM-N 220 Introduction to Media Application Development (3 cr.)
- NEWM-N 232 Intro to Gameplay Scripting (3 cr.)

Students may test out of the 3D graphics or programming requirement by prior learning assessment, in which case they take an additional advanced course.

Two Course Gaming Core

- NEWM-N 230 Introduction to Game Design and Development (3 cr.)
- NEWM-N 330 Intermediate Game Design and Development (3 cr.)

Advanced Course or Elective

Select one of the following courses:

- NEWM-N 331 Game Testing and Evaluation (3 cr.) (recommended)
- NEWM-N 430 Advanced Game Design and Development (3 cr.) (recommended)
- CGT 11600 Geometric Modeling for Visualization and Communication (3 cr.) or
- NEWM-N 243 Introduction to 3D (3 cr.)
- CSCI 43700 Introduction to Computer Graphics (3 cr.)
- CSCI 43800 Advanced Game Development (3 cr.)
- CSCI-N 355 Introduction to Virtual Reality (3 cr.)
- CSCI-N 451 Web Game Development (3 cr.)
- NEWM-N 332 Intermediate Gameplay Scripting (3 cr.)

- NEWM-N 333 Creature and Character Design for Videogames, Comics, Film, and Animation (3 cr.)
- NEWM-N 261 Storyboarding for Multimedia (3 cr.)
- NEWM-N 335 Character Design and Animation (3 cr.)
- NEWM-N 337 Virtual World Design and Development (3 cr.)
- NEWM-N 339 Augmented Reality Application Design and Development (3 cr.)
- NEWM-N 434 Serious Games and Simulations (3 cr.)
- NEWM-N 436 Game Production (3 cr.)

Students must earn a C- or higher in each course and maintain a 2.0 GPA.

last updated: 3/2024

Studio Art and Technology Minor

Studio Art and Technology Minor

Visual platforms transcend language, resonating across the widest audiences. Get your message to the masses by becoming an effective visual communicator, combining traditional foundations of art with the digital techniques of the here and now.

From basic drawing techniques to web page design and layout, learn to combine media, development, and artistic skills to broaden your communications knowledge and impact. The Studio Art and Technology minor, offered jointly through the Herron School of Art and Design and Luddy Indianapolis, offers a unique combination of courses from Media Arts and Science, Fine Arts and Visual Communication Design.

Minor Requirements

18 credit hours are required for this minor, which is only open to students majoring in Media Arts and Science.

- HER-E 101 Beginning Drawing (or D101 Drawing 1)
- HER-E 102 Beginning Drawing 2 (or D102 Drawing 2)
- HER-S 201 Sculpture I

Choose one of the following:

- NEWM-N 201 Design Issues in Digital Media (may be counted as a general education course in the Arts and Humanities)
- NEWM-N 215 Intermediate Multi-Device Web Development (Prerequisite: N115)
- NEWM-N 243 Introduction to 3D
- NEWM-N 253 Introduction to Digital Video
- NEWM-N 255 Introduction to Digital Sound

Choose two of the following:

- HER-D 251 Anatomy for Artists (3 credits)
- HER-Q 261 Introduction to CNC (3 credits)
- HER-S 202 Sculpture II (Sculpture I is prerequisite, 3 credits)
- HER-V 210 Foundations of Graphic Design (3 credits)
- HER-D 230 Figure Drawing (3 credits)
- HER-V 211 Typography I (3 credits)
- HER-V 251 Typography II (3 credits)

last updated: 3/2024

Video Production Minor

Video Production Minor (15 cr.)

You'll master filmmaking techniques through experiential learning when you earn our undergraduate minor in Video Production.

Students use industry-standard equipment, advanced editing software, professional lighting techniques, and digital effects. Utilize field production techniques as you shoot interviews and narrative scenes to create documentaries and short narrative films.

Learn how to plan, shoot, edit, and deliver complex video productions. You'll apply advanced lighting and photography techniques for a variety of conditions while putting into practice the principles of composition, continuity, cinematic space, and A/B roll editing. Prepare to develop story ideas, translate them into a visual medium, and structure them effectively using creative methods of information presentation and narrative storytelling.

Core (9 cr.)

- NEWM-N 253 Introduction to Digital Video (3 cr.)
- NEWM-N 353 Intermediate Digital Video (3 cr.)
- NEWM-N 356 Lighting and Field Production (3 cr.)

Selectives (6 cr.)

Select two:

- NEWM-N 255 Introduction to Digital Sound (3 cr.)
- NEWM-N 354 Directorial Analysis, Production, and RAW Workflow (3 cr.)
- NEWM-N 355 Intermediate Digital Sound Design (3 cr.)
- NEWM-N 357 Digital Effects (3 cr.)
- NEWM-N 415 Documenting Cultural Heritage: Artifacts and Traditions (3 cr.)
- NEWM-N 453 Advanced Digital Video (3 cr.)
- NEWM-N 456 Digital Cinema (3 cr.)
- NEWM-N 468 Video for Social Change (3 cr.)

Additional Herron and Liberal Arts courses, including topics courses, seminars, and independent studies, may be counted as selectives with the faculty advisor's approval.

Substitute Courses

CGT 34600 Digital Video and Audio (3 cr.), HER-K 300 Photography and Intermedia: Time-based Art (3 cr.), or MUS-A 242 Music Technology Lab IV may be taken instead of NEWM-N 253 Introduction to Digital Video (3 cr.) to satisfy the core requirement.

MUS-Z 320 Advanced Special Topics in Music/Non-Majors: Digital Sound Design (3 cr.) may be substituted for NEWM-N 255.

Students must earn a C or higher in each course to graduate with the Video Production minor.

last updated: 3/2024

Human Computer Interaction (HCI) Undergraduate Certificate

Human Computer Interaction (HCI) Undergraduate Certificate
Upon completion of the undergraduate Human-Computer Interaction Certificate, students will be able to demonstrate knowledge in the following core competencies:

1. **Basic Human-Computer Interaction Theory and Usability Terms, Principles and Practices**
   - Understanding of human-computer interaction and usability terms, concepts, principles and practices
   - Problem space definition and conceptual models of interactive products
   - User-centered approaches to interaction design as applied to software and the web
   - User profiling, needs and requirements
   - Interface design principles and processes; including related areas of visual design
   - Cognitive and information processing
   - Processes and life-cycles of interactive product design
   - Interactive product evaluation and testing methods, both qualitative and quantitative
2. **Ability to Understand and Demonstrate Basic Design and Evaluation of Interactive Products Up to the High Fidelity Prototype Stage**
   - Interactive product interface design and prototyping based on user/needs assessments
   - Human-computer interaction principles and a user-centered approach to interaction design as applied to software and the Web
   - Apply evaluation and usability testing methods to interactive products to validate design decisions

Last update: 02/04/2014

Undergraduate Informatics Certificate

Undergraduate Informatics Certificate
Upon completion of the undergraduate Informatics Certificate, students will be able to demonstrate knowledge in the following core competencies:

1. **Technical Knowledge:**
   - Define terms and explain basic principles important to the operation of computing systems, as well as fundamental programming concepts
   - Demonstrate knowledge and skills in data representation, models, structures and management
2. **Social Dynamics of Informatics and Information Technology:**
   - Understand and apply major societal trends affecting the development and deployment of modern day IT, such as access, privacy, intellectual property, security and others
   - Critically analyze the impact of IT on individuals, groups and organizations at local and global levels
   - Analyze the social, cultural and organizational settings in which technology solutions will be deployed to achieve successful implementation
3. **Domain-specific* Critical Thinking and Problem Solving Skills:**
   - Define terms and explain basic principles, concepts and theories from another domain or discipline in which IT skills will be applied
   - Access evolving trends in information technology and IT research
   - Synthesize and analyze information and ideas from multiple sources and perspectives
   - Evaluate data, arrive at reasoned conclusions and solve challenging problems
4. **Collaborative Teamwork:**
   - Select and effectively utilize oral, written, visual and quantitative communication skills within the context of an interdisciplinary team
   - Identify and demonstrate the skills, behaviors and attitudes necessary to function as an effective team member, including working cooperatively with diverse group members
   - Articulate legal and ethical issues when using the creative work of others; respect the intellectual property of others
5. **Professional Ethics and Development:**
   - Participate in the development of a personal code of ethics that considers information ethics
   - Articulate principles for resolving ethical conflicts

Last update: 02/04/2014

Undergraduate Legal Informatics Certificate

Undergraduate Legal Informatics Certificate
Upon completion of the undergraduate Legal Informatics Certificate, students will be able to demonstrate knowledge in the following core competencies:

- Students will be prepared to find employment in law firms and legally-related agencies and organizations, such as courts, law schools, non-profit organizations, regulatory agencies, and vendors that develop and sell products for the legal industry. For example, most federal courts in the U.S. use electronic filing, docket control and document retrieval, provide legal documents and information to the public through websites, offer webinars of oral arguments and other proceedings and have sophisticated systems for courtroom presentations. State courts are moving to become what is known as “the electronic courtroom.” The International Legal Technology Association

(ITLA) has a long list of job openings that would provide interesting positions for those who complete the Certificate in Legal Informatics. Moreover, *Fifty Legal Careers for Non-Lawyers* describes a number of career opportunities that are encompassed in the legal informatics curriculum.
- Students who are already working as law technology professionals or paralegals will have an opportunity to update their skills and to have a recognizable certificate from a high-quality institution of higher education, namely, the IU School of Informatics, IU Indianapolis.
- Students will be prepared to bring cutting edge technology to law practices and other legally-related organizations and will not require training on these systems beyond a customary orientation program.
- Students will implement systems and technology that will impact the quality and cost of client services, ease the workload and enhance the productivity of busy attorneys and add greater efficiency to a variety of legally-related agencies and organizations.
- Students who want to focus on electronic discovery in their future careers will be able to sit for the electronic discovery certification examinations being developed by the Organization of Legal Professionals (OLP).

Last update: 02/06/2014

Undergraduate Medical Coding Certificate

Undergraduate Medical Coding Certificate
Students completing the Medical Coding Certificate will aquire competencies in several domains.

Domain I - Life Sciences

1. **Anatomy and Physiology**
   - Identify the structures and functions of the human body
   - Locate anatomical online lookups (Adam, etc.)
2. **Medical Terminology**
   - Demonstrate their ability to spell, define, and pronounce medical terms of major disease processes, diagnostic procedures, laboratory tests, abbreviations, drugs, and treatment modalities
   - Demonstrate knowledge of root/suffix/prefix word build concepts and common medical terms
3. **Pathophysiology**
   - Identify specific disease processes by human body system
   - Identify cause, diagnosis, and treatment for each disease process
4. **Pharmacotherapy & Laboratory Findings**
   - Recognize the action of drugs such as: absorption, distribution, metabolism and excretion by the body.
   - Differentiate between drug classifications
   - Identify the most commonly prescribed drugs
   - Describe a formulary
   - Match drugs to common conditions
   - Match drugs to lab findings

Domain II - Information Technology

1. **Introduction to Desktop Applications**
   - Demonstrate keyboard and web access skills
   - Identify concepts related to hardware and software
   - Demonstrate knowledge of Microsoft Office Suite applications
2. **Computer Software Applications in Healthcare**
   - Recognize commonly used software in healthcare
   - Compile public reporting for disease and disease trends
   - Describe how acute care organizations store and retrieve electronic health records
   - Analyze different types of encoder software
   - Analyze online coding tools (coding reference tools)
   - Evaluate Computer Assisted Coding (CAC) software
   - Identify the issues involving the migration from a paper-based Health Information Management department to an electronic Health Information Management department
   - Summarize acute care environment vendors and their system strengths.
   - Evaluate an Electronic Health Record (EHR)
   - Evaluate a Personal Health Record (PHR)
   - Evaluate Heath Information Exchanges (HIE)

Domain III - Health Information Management

1. **Introduction to Health Information Management**
   - Recognize the content & structure of healthcare data
   - List the content of medical records
   - State the documentation requirements for medical records
   - Identify legal/ethics issues in Health Information Management such as privacy, security, and the Health Insurance Portability & Accountability Act
   - Recognize release of Information issues
   - Identify the Code of Ethics for Health Information Management
2. **Healthcare Delivery Systems**
   - Identify types of healthcare organizations
   - Identify types of healthcare workers
   - Identify healthcare settings that employ coders
   - Understand the types and levels of Healthcare Delivery Systems in the U.S., and of the governing bodies that regulate the Health Information Management processes, and an understanding how eHIM will change this environment
   - Recognize the organization of healthcare delivery
   - Interpret accreditation standards
   - Discuss licensure/regulatory agencies

Domain IV - Clinical Classification Systems

1. **Basic Diagnosis Coding Systems**

- Demonstrate knowledge of the International Classification of Diseases ICD-9-CM
- Recognize diagnostic based prospective payment groups such as DRG, APR-DRG, & RUGS.
- Recognize the International Classification of Diseases ICD-10-CM
- Recognize the Systematized Nomenclature of Medicine (SNOMED)
- Demonstrate knowledge of Current Procedural Terminology (CPT)
- Recognize procedure based payment systems such as Resource Based Relative Value (RBRV), Evaluation &Management and Ambulatory Payment Classification (APC)
- Identify the impact that coding and sequencing has on reimbursement

2. **Reimbursement Methodologies**
   - Identify Ambulatory Surgery Center reimbursement
   - Identify third party payers
   - Describe billing and insurance procedures
   - Discuss an explanation of benefits
   - Recognize Quality Improvement Organizations (QIO) and their role in the payment process
   - Identify charge master description and maintenance
   - Describe managed care/capitation
   - Recognize compliance issues
   - Audit and monitor the coding process for regulatory compliance

Last updated: 02/04/2014

Bachelor of Science in Health Information Administration

Bachelor of Science in Health Information Administration
Upon graduation, students are eligible for a national registry examination offered through the American Health Information Management Association (AHIMA) and earn the credential of Registered Health Information Administrator (RHIA). This credential exhibits the graduate's expertise in the professional fields of Health Information Management.

Indiana University takes great pride in the fact that graduates of the Health Information Management program have exceeded the AHIMA national average scores on all core competencies on the Registered Health Information Administrator (RHIA) national exam.

Graduates of the Health Information Administration undergraduate program will demonstrate expertise in the following core competencies essential to success as an informatics, computing and information technology professional specializing in health information:

1. **Health Data Management**
   1. Health Data Structure, Content and Standards
   2. Healthcare Information Requirements and Standards
   3. Clinical Classification Systems
   4. Reimbursement Methodologies
2. **Health Statistics, Biomedical Research and Quality Management**
   1. Healthcare Statistics and Research
   2. Quality Management and Performance Improvement
3. **Health Services Organization and Delivery**
   1. Healthcare Delivery Systems
   2. Healthcare Privacy, Confidentiality, Legal and Ethical Issues
4. **Information Technology & Systems**
   1. Information and Communication Technologies
   2. Data, Information, and File Structures
   3. Data Storage and Retrieval
   4. Data Security
   5. Healthcare Information Systems
5. **Organization and Management**
   1. Human Resources Management
   2. Financial and Resource Management
   3. Strategic Planning and Organizational Development
   4. Project and Operations Management

Last updated: 02/04/2014

Student Learning Outcomes

Student Learning Outcomes

Informatics is an applied, professional computing discipline. It responds to society's need to solve increasingly complex problems in all fields of human endeavor by acquiring, managing and interpreting data. Informatics studies the ways in which people, information and digital technologies interact.

Nearly all fields benefit from the rapidly evolving fields of computing and information science. Informatics graduates solve problems through the application of computing or computation in the sciences, business, the humanities and the arts.

Computing and information technology are evolving rapidly. The student learning outcomes articulated here are central to educating Informatics graduates who possess both the technological and human-centered design skills necessary to develop and deploy useful digital tools that acquire and manage data for informed decision-making. They incorporate intellectual and ethical standards that every Luddy School of Informatics, Computing, and Engineering graduate should attain.

Bachelor of Science Degrees

- **Applied Data and Information Science**: graduates focusing on Applied Data will Develop math and tech skills to analyze complex data sets and solve real-world problems. Study analytics, cloud computing, and information infrastructure. Learn to design algorithms and make decisions effectively, using big data insights. Graduates focusing on Applied Information Science will Develops skills to organize, access, and manage datasets. Study

data curation and management, data archives, and data organization. Explore the societal impact of data work to responsibly manage the data we create every day.

- **Artificial Intelligence (BA)**: graduates will learn about Design user interfaces to improve human-AI interaction and real-time decision-making, Evaluate the advantages, disadvantages, challenges, and ramifications of human-AI augmentation, Design and develop symbiotic human-AI systems that balance the information processing power of computational systems with human intelligence and decision making, Explain the benefits, limitations, and tradeoffs of designing engaging and ethical conversational user interactions, including those supported by chatbots, smart speakers, and other AI-driven, voice-based technologies and Design and evaluate conversational interfaces for different users and contexts of use.
- **Biomedical Informatics**: graduates enrolled in our Biomedical Informatics degree program learn how to effectively use biomedical data, information, and knowledge for scientific inquiry, problem-solving, and decision making, motivated by efforts to improve human health.
- **Computer Science:** graduates will learn programming, data structures, discrete structures, computer architecture, algorithms and theory of computation as well as exploring operating systems, software engineering, programming languages, computer networks and cybersecutiry. Individual courses will allow students to pursue certifications for industry tests.
- **Health Information Management**: graduates will learn about data governance, content and structure, information protection access, use, disclosure, privacy and security, informatics, analytics and data use, revenue cycle management, health law and compliance, and organizational management and leadership in the health industry.
- **Informatics**: graduates will demonstrate expertise in the following core competencies essential to success as an informatics, computing, and information technology professional. Those competencies are: Foundations of Informatics and Computing, problem solving and critical thinking, data studies and analytics, design and analysis of information systems, social dynamics of informatics and information technology, and professional and domain specific knowledge and skills.
- **Media Arts and Science**: the following core competencies essential to success as an informatics, computing and information technology professional specializing in new and interactive media:
    1. Communicate ideas effectively in written, oral, and visual form to a range of audiences.
    2. Work effectively as a member of a team to achieve a common goal.
    3. Analyze a problem, identify and evaluate alternatives and plan an appropriate solution.
    4. Evaluate media from multiple perspectives using the theories, concepts, and language of digital media with an appreciation for the history, theory, and traditions of digital media.
    5. Demonstrate mastery of the concepts, techniques and tools in one or more digital media specialties.
    6. Develop professional quality digital media productions by promptly applying knowledge and skills including best practices and standards.
    7. Explain the impact of digital media on individuals, organizations and society.
    8. Acknowledge diverse opinions regarding professional, ethical, legal and social issues with a global perspective.
    9. Appreciate the need for lifelong learning and have a plan for continuing professional development.
    10. Understand digital media and its effective use as a form of communication.
- **Full Stack Development (Informatics BS+ Media Arts and Science BS)**: will combine the learning outcomes of both the Informatics and Media Arts and Science degrees with a special focus on web design and development.

Undergraduate Certificates

- **Applied Data Science**: students will learn to develop data-driven solutions, allowing us to better understand ourselves, our communities, and the global market. Unlocking the power of data enables us to run businesses more efficiently, make groundbreaking scientific discoveries, and promote the common good. And, develop mathematical and technological skills to analyze data sets, leading to valuable knowledge and the societal implications of data work, including privacy and surveillance.
- **Applied Data Information Science**: students will demonstrate the value of data in society and articulate the roles of data creators and consumers, apply principles of representation and organization to provide access to resources in various information environments, interpret stakeholder needs for databases and information layers using iterative and reflexive design processes, identify the stages of the data curation process and the issues associated with the storage, preservation, and security of data, analyze the implications of data policy creation, the concerns involved, and its communication to information organizations.
- **Artificial Intelligence:** graduates will acquire AI knowledge and skills using algorithms or results produced by artificial intelligence in a variety of ways to apply towards work as an artificial intelligence specialist, business intelligence analyst, cloud engineer, data scientist and machine learning engineer.
- **Human-Computer Interaction**: graduates will be able to demonstrate knowledge in the following core competencies: interactive product interface design and prototyping based on user/needs assessments, human-computer interaction principles and a user-centered approach to interaction design as applied to software and the web and apply evaluation and usability testing methods to interactive products to validate design decisions.

- **Legal Informatics**: graduates will be able to implement specialized technology in law firms and law-related organizations, assist with presenting a legal case in court, handle electronic evidence with confidence, incorporate effective information governance into any organization, establish proper security and privacy programs and protect an organization's intellectual property.
- **Medical Coding**: To make valid decisions, accurate information is key, The medical coder carefully reviews health records for accurate coding and billing. By earning this certificate, you'll learn to understand medical terminology, private payer policies, and government regulations,
- **Multi-Device Development**: boot camp-style program equips you with the skills for an entry-level job creating client-side websites and web and mobile applications, earning $40,000 a year or more. It's ideal for recent high school graduates and adult learners.
- **Post Baccalaureate in Health Information Management:** graduates will enhance their biological or health science bachelor's degree with courses that will prepare for a career in the health information industry along with potential accreditation with the RHIA.
- **Software Bots for Cognitive Automation**: certificate prepares for jobs in intelligent process automation cover a wide area, including design, development, and analysis, This job-driven certificate in consultation with companies that expect a growing need for designers, developers, and analysts in cognitive automation.
- **Virtual Production**: certificate empowers filmmakers, actors, and animators across multiple locations to collaborate in real time, They create together by using software tools to combine live-action footage with computer-generated graphics. Virtual production has become integral to filmmaking. Studios need talent with a solid understanding of this new field in digital cinema. Gain in-demand skills by earning an undergraduate certificate in virtual production. You'll learn the software and equipment used to create virtual sets and reactive backgrounds in real time,

Last updated: 3/2024

Bachelor of Science in Informatics

Bachelor of Science in Informatics
Graduates of the Informatics undergraduate program will demonstrate expertise in the following core competencies essential to success as an informatics, computing and information technology professional:

1. **Technical Knowledge:**
    - Demonstrate knowledge and skills in the mathematical and logical foundations of informatics, data representation, models, structures and informatics-centric management
    - Define terms and explain basic principles essential to the design and development of IT and computing systems
    - Acquire fundamental concepts and skills in software architectures and the development of information systems
2. **Social Dynamics of Informatics and Information Technology:**
    - Understand and apply major societal trends affecting the development and deployment of modern day IT, such as access, privacy, intellectual property, security and others
    - Critically analyze the impact of IT on individuals, groups and organizations at local and global levels
    - Apply a user-centered approach to interaction design and product usability, including techniques for quantitative and qualitative testing of interface and interaction design
    - Utilize digital tools to communicate with a range of audiences
    - Analyze the social, cultural and organizational settings in which IT solutions will be deployed to achieve successful implementation
3. **Domain-specific* Critical Thinking and Problem Solving Skills:**
   **Domains are areas of specialization that may include business, science, the arts or humanities.*
    - Define terms and explain basic principles, concepts and theories from another domain or discipline in which IT skills will be applied
    - Deploy IT resources in the context of another domain and/or discipline
    - Synthesize, analyze and conceptualize information and ideas from multiple sources and perspectives
    - Evaluate data, arrive at reasoned conclusions and solve challenging problems
4. **Collaborative Teamwork:**
    - Select and effectively utilize oral, written, visual and quantitative communication skills within the context of an interdisciplinary team
    - Identify and demonstrate the skills, behaviors and attitudes necessary to function as an effective team member, including working cooperatively with diverse group members
    - Acquire the skills to initiate, manage and execute an IT project
    - Articulate legal and ethical issues when using the creative work of others; respect the intellectual property of others
5. **Professional Ethics and Development:**
    - Create a personal code of ethics; articulate principles for resolving ethical conflicts
    - Commit to a regular program of continuing education and lifelong learning that is independent of employer sponsorship
    - Participate in professional organizations that promote responsible computing and service to society

Last updated: 02/04/2014

Bachelor of Science in Media Arts and Science

Bachelor of Science in Media Arts and Science
Graduates of the Media Arts and Science undergraduate program will demonstrate expertise in the following core competencies essential to success as an informatics, computing and information technology professional specializing in new and interactive media:

1. Understand digital media and its effective use as a form of communication.
2. Communicate ideas effectively in written and oral form to a range of audiences.
3. Work effectively as a member of a team to achieve a common goal.
4. Analyze a problem, identify and evaluate alternatives, plan an appropriate solution.
5. Appreciate the history, theory, and traditions of digital media. Evaluate media from multiple perspectives using the theories, concepts, and language of digital media.
6. Demonstrate mastery of the concepts, techniques, and tools in one or more digital media specialties.
7. Apply knowledge and skills to develop professional quality digital media productions in a timely manner and utilizing best practices and standards.
8. Explain the impact of digital media on individuals, organizations, and society.
9. Acknowledge diverse opinions regarding professional, ethical, legal, and social issues with a global perspective.
10. Appreciate the need for lifelong learning and have a plan for continuing professional development.

Last updated: 02/04/2014

Undergraduate Programs

Undergraduate Programs

The Luddy School of Informatics, Computing, and Engineering offers Bachelor of Science degrees in Applied Data and Information Science, Artificial Intelligence, Biomedical Informatics, Computer Science, Health Information Management, Informatics, Media Arts and Science and Full Stack Development which combines Informatics and Media Arts and Science as a dual degree.

The very nature of these degrees, with the changing technologies and applications, requires that the content of each degree be continuously assessed and revised. Therefore, the faculty of the Luddy School of Informatics, Computing, and Engineering will periodically review and revise the curricula to ensure that students are prepared to meet contemporary workplace and intellectual demands.

Accelerated Bachelor's and Master's

Earn a bachelor's and master's degree by completing both undergraduate and graduate programs in only 5 years, and get an accelerated start to your future career.

Please contact the Luddy School of Informatics, Computing, and Engineering office, or refer to our website at luddyIN.edu to confirm current program requirements.

Last Updated: 3/2024

Clinical Informatics

Clinical Informatics

Passionate about information technology, workflow redesign and engagement strategies for health care clinicians? This one-year certificate program is designed for licensed physicians, nurses and other clinical health care professionals seeking leadership roles leveraging information systems to

- Improve health care safety and quality
- Maximize workflow efficiencies
- Preserve user and patient satisfaction

New government requirements for electronic health record adoption and utilization will create a shortage of qualified clinical leaders who truly understand information systems and how to implement them to decrease medical errors and adverse events, while improving overall quality and patient outcomes. Completion of this training program prepares the participant for the implementation of certified electronic health record systems.

Training includes two core courses, three specialized courses and a mentored practicum for a total of 18 credit hours to be completed within one year.

Core Curriculum
- INFO B530 Foundation of Health Informatics
- INFO B581 Health Informatics Standards and Terminology

Specialized Courses (Choose 3)
- INFO B505 Informatics Project Management
- INFO B578 Data Analysis
- LIS S644 Consumer Health Informatics
- INFO B641 Business of Health Informatics
- INFO B643 Natural Language Processing
- INFO B535 Clinical Information Systems
- INFO B642 Clinical Decision Support Systems

Mentored Practicum
- INFO B584 Practicum in Health Information Technology

The mentored practicum provides the opportunity to synthesize coursework and demonstrate competency in clinical informatics in the context of a real-world health care environment.

Human-Computer Interaction

Human-Computer Interaction

The **Graduate Certificate in Human-Computer Interaction** (HCI) program is a 15-credit-hour program focusing on the core theory and best practices of the discipline. All certificate requirements must be completed within three years and with a minimum cumulative G.P.A.

of 3.0 (B). Courses with a grade below a B- will not count. All courses may be taken via distance education.

Admission requirements for the certificate program are the same as those for the M.S. program.

Required Core (12 cr.)

Course	Fall	Spring	Online
INFO H541 Interaction Design Practice (3 cr.)	Yes	No	Yes
INFO H563 Psychology of HCI (3 cr.)	Yes	No	Yes
INFO H543 Interaction Design Methods (3 cr.)	Yes	No	Yes
INFO H561 Meaning and Form in HCI (3 cr.)	No	Yes	Yes

Specialization Requirements (3 cr.)

Select one course.

Course	Fall	Spring	Online
INFO H564 Prototyping for Interactive Systems (3 cr.)	No	Yes	Yes
INFO H590 Ubiquitous Computing (3 cr.)	No	Yes	No
INFO H590 Social Computing (3 cr.)	No	Yes	No

Note: *The semester a course is offered can change. The student is responsible for checking the Registrar for confirmation.*

Note: Applicants who have already earned credit for one or more equivalent courses from other institutions and programs may request to apply/transfer up to three credits toward this certificate, subject to approval. No undergraduate courses can be applied to certificate requirements.

Health Information Management and Exchange

Health Information Management and Exchange

The primary intent of this certificate training program is to produce skilled participants able to improve health care delivery through the timely collection, management, retrieval, exchange and analysis of electronic health information.

Upon successful completion of the program, participants will

- Achieve a fundamental level of understanding of secure biomedical information management and exchange
- Possess an advanced level of proficiency with respect to coding, classification and medical terminologies
- Achieve an advanced level of proficiency with respect to data management, data quality and data exchange.
- Be competitive for careers like “EHR Implementation Analyst” within health care and public health organizations

The Health Information Management and Exchange Specialist program is designed for post-baccalaureate graduates in healthcare degree programs who desire specialized training in information systems, storage and retrieval.

This 18 credit hour program includes five courses and mentored practicum to be completed within one year.

Core Curriculum

- INFO B582 Health Information Exchange
- INFO B583 Security and Privacy Policies and Regulations for Health Care
- INFO B641 Business of Health Informatics
- INFO B530 Foundations of Health Informatics
- INFO B581 Health Informatics Standards and Terminology

Mentored Practicum

- INFO B584 Practicum in Health Information Technology

The mentored practicum provides the opportunity to synthesize the coursework and demonstrate competency in the role of an EHR Implementation Analyst. Students will be able to demonstrate their comprehension, critical thinking, and problem solving abilities alongside faculty and staff in a real-world environment with a proven leader in health information exchange.

Health Information Security

Health Information Security

This certificate program provides comprehensive knowledge and skill in health information security program development and administration, including policy, procedures, architectures, risk assessment, disaster recovery and business continuity for both health care and public health organizations. Program graduates will be prepared to take on the roles like:

- Information Security Officer
- Health Information Privacy and Security Specialist
- Chief Healthcare and Information Privacy and Security Officers (CISO),

Successful applicants will possess a bachelors or masters degree who are seeking professional education in health IT.

This 18 credit hour program includes six courses and mentored practicum to be completed within one year.

Core Curriculum
- INFO B535 Clinical Information Systems
- INFO B581 Health Informatics Standards and Terminology
- INFO B583 Security and Privacy Policies and Regulations for Health Care
- INFO B590 Topics in Informatics

Mentored Practicum
- INFO B584 Practicum in Health Information Technology

The mentored practicum allows students to integrate classroom training with real-world experiences. Depending upon the venue chosen, this practical experience may include:

- Working alongside faculty/staff from the Indiana School of Medicine and Regenstrief in electronic health care systems
- Developing and integrating security and privacy policies into real health care systems
- Participating in privacy/security projects that involve the Marion County Public Health Department
- Involvement in one of many funded research groups with projects in-progress across the broad spectrum of clinical, public health and health informatics

Graduate Certificate Programs

Graduate Certificate Programs

In addition to Master's and PhD degree programs, the Luddy School of Informatics, Computing, and Engineering offers a number of graduate certificate programs:

- Archives Management
- Clinical Informatics
- Computer Science
- Health Information Management and Exchange
- Health Information Security
- Human-Computer Interaction
- Public Health Professionals
- School Library

last updated: 3/2024

Informatics for Public Health Professionals

Informatics for Public Health Professionals

The Public Health Leader certificate training program prepares public health professionals to develop, procure and implement information systems that meet public health program needs. This includes

- Supporting the development of strategic direction for public health informatics within the enterprise
- Using informatics standards
- Managing and monitoring IT operations
- Evaluating information systems and their applications
- Contributing to the development of interoperable public health information systems
- Implementing solutions that ensure the confidentiality, security, and integrity of captured data while maximizing the availability of information for public health

The scope of this program is designed to meet the core competencies for public health informaticians as described by the Centers for Disease Control and Prevention. Based upon this guidance, ideal eligible students entering this program will have a graduate or doctoral level preparation in public health, including demonstrated course work in epidemiology and data analysis. The requirement for masters or doctorate level preparation may be waived by the demonstration of significant public health experience through years of service and a leadership role at a public health agency. Participants will complete a mentored project in health informatics with a focus on a public health research or community project.

Training includes two core courses, three specialized courses, and a mentored practicum to be completed within one year.

General Course Requirements
18 graduate credit hours are required, including:

- Two core courses (6 credits)
- Three specialization courses (9 credits)
- Practicum (3 credits)

Core Courses (6 credits)
- PBHL P650 Readings in Public Health with subtopic Foundations in Public Health Informatics
- INFO B581 Health Information Standards and Terminology

Specialization (9 credits)
- INFO B505 Informatics Project Management
- INFO B578 Data Analysis
- LIS S644 Consumer Health Informatics
- INFO B535 Clinical Information Systems
- INFO B583 Security and Privacy Policies and Regulations for Health Care

Mentored Practicum (3 credits)
- INFO B584 Practicum in Health Information Technology

The mentored practicum focuses on participation in the development of knowledge management tools for the public health enterprise, ensuring that the knowledge, information, and data needs of the project, program users and other stakeholders are met, applying public health informatics research, and supporting the use of informatics to integrate clinical health, environmental risk and population health.

Additionally, all training participants are expected to participate in the Indiana Center of
Excellence in Public Health Informatics (ICEPHI) monthly work-in-progress seminars.
The ICEPHI brings together the expertise of the following institutions:

- The Polis Center, a national leader in community-based and public health research and applications using geographic information technologies
- The Indiana State Health Department
- The Marion County (Ind.) Health Department
- The IU School of Medicine's Department of Public Health
- The Department of Geography in the School of Liberal Arts at IU Indianapolis
- IU Indianapolis' Center for Health Geographics
- A data visualization group at IU-Bloomington

After training participants complete their mentored practicum, they are required to present their outcomes at a monthly ICEPHI meeting.

School Librarianship Certificate

The School Librarianship Certificate is for certified teachers interested in adding to their license. The core learning concepts for the certificate include: collaborative instruction, design, delivery, and assessment, integrated technology, student inquiry, 21^{S} Century skills and processes, collection development, library program administration, basic resources and ILS management, PK-12 youth literature, and advocacy and leadership.

For more information please contact Kym Kramer, MLS, Director of School Library Education, kakramer@indiana.edu, 317-278-2093.

Requirements

6 courses totaling 16 credits

- LIS-S 502 Acquisitions and Management of Knowledge and Information
- LIS-S 571 Materials for Youth or LIS-S 672 Seminar on Literature for Youth
- LIS-S 573Education of Information Users
- LIS-S 574 Information Instruction
- LIS-S 604 Topics in Library & Information Science (Cataloging for School Librarians)
- LIS-S 671 School Media

last updated 4/19/2019

Archives Management Certificate

The Archives Management Certificate provides an exciting educational opportunity for prospective students throughout Indiana and the U.S. including working professionals, who would like to keep up with changes and earn an additional credential; professional changing careers within the same field and students from relevant fields (e.g. history and museum studies).

Our program gives students core knowledge and skills they need to develop to be a professional archivist, by addressing the core values for archivists stated by the Society of American Archivists (SAA).

Requirements

This certificate requires a total of 18 credit hours.

Core Course requirement (12 credit hours)

LIS-S581 Archives and Records Management

LIS-S582 Digital Preservation

LIS-S584 Archival Arrangement and Description

LIS-S585 Archival Appraisal and Management

Electives (6 credit hours)

Two electives from the suggested list.

LIS-S583 Data Curation and Management

LIS-S586 Archival Intelligence

LIS-S591 Grant Writing

LIS-S605 Internship in Library and Information Science

LIS-S623 Genealogy and Local Hisotry

LIS-S685 Electronic Records Management

LIS-S686 Web Archiving and Preservation

Non-LIS graduate students are required to take LIS-S500 Methods and Tools for the Information Profession.

last updated: 3/2024

Applied Data Science

Applied Data Science

You'll learn methods of data mining, to transform large datasets into usable knowledge, and how to represent information visually. The master's in data science provides students with core competencies in the latest methods of analysis, data management, and infrastructure and high-throughput data processing and storage.

Our curriculum includes instruction in client–server application development and the professional and ethical management of data science projects.

The plan of study is 30 credit hours. It includes six core courses and four elective courses. Transfer students may be able to transfer in approved graduate courses from an accredited institution.

F-1 students can only take one online course per semester. They must take a minimum of 8 credit hours per semester; the exception being in their final semester. These limitations apply to fall and spring semesters but not summer sessions.

Core Courses (18 cr.)

- INFO-I 501 Introduction to Informatics
- INFO-H 510 Statistics for Data Science
- LIS-S 511 Database Design
- INFO-H 515 Statistical Learning (prerequisite: graduate statistics course)
- INFO-H 516 Cloud Computing for Data Science (prerequisites: graduate database course)
- INFO-H 611 Mathematical and Logical Foundations of Informatics

Students may test out of INFO-H 611 and LIS-S 511. Students do not receive credit toward their required 30 credit hours by testing out of a course. However, they may

instead replace the course with a specialization course or approved elective.

Elective Courses (12 cr.)

- INFO-B 505 Informatics Project Management
- INFO-H 517 Visualization Design, Analysis, and Evaluation (prerequisite: programming experience)
- INFO-H 518 Deep Learning Neural Networks
- INFO-H 519 Natural Language Processing with Deep Learning
- INFO-H 695 Thesis/Project in Applied Data Science
- INFO-I 575 Informatics Research Design
- INFO-I 595 Professional Internship
- INFO-I 698 Research in Informatics (Independent Study)
- INFO-P 502 Modeling Crisis
- NEWM-N 510 Web Database Development

Students may replace elective courses with non-Luddy courses with the permission of the program director.

Thesis or Project

The Thesis/Project is available to highly motivated students ready to carry out publishable research. Students must prepare a prospectus and gain a commitment from a primary faculty advisor with research interests in data science by the end of the first semester. By the end of the second semester, students must complete a course on research design and methods (e.g., INFO-I 575 or LIS-S 506).

The thesis or project must be completed in two semesters or in a semester and summer. Thesis students register for a total of 6 credits and project students register for a total of 3–6 credits of INFO-H 695 Thesis/Project in Applied Data Science. Students are required to prepare and defend a research proposal with a timeline of deliverables in addition to the thesis or project.

Last updated: 3/2024

Applied Data Science with Sports Analytics Specialization

Master of Science in Applied Data Science with a specialization in Sports Analytics

Combine sports marketing skills with the analysis and management of data when you earn a master's in Applied Data Science with a specialization in Sports Analytics at IU Indianapolis. Analytics is a crucial part of decision-making in amateur and professional athletics. Teams rely on those with the knowledge to interpret data and relate it to the world of athletics.

Students who earn a Master of Science in Applied Data Science with a specialization in Sports Analytics learn core competencies in data analysis, data management and infrastructure, and client–server application development, and ethical and professional management of informatics projects. Earn additional competencies in sports sales, the management of massive, high-throughput data stores, cloud computing, and the data life cycle.

Plan of Study (30 credits)

The plan of study is 30 credit hours. It includes six core courses and four specialization/ elective courses. Transfer students may be able to transfer in approved graduate courses from an accredited institution.

F-1 students can only take one online course per semester. They must take a minimum of 8 credit hours per semester; the exception being in their final semester. These limitations apply to fall and spring semesters but not summer sessions.

Core Courses (18 credits)

- INFO-I 501 Introduction to Informatics
- LIS-S 511 Database Design
- INFO-H 510 Statistics for Data Science
- INFO-H 515 Statistical Learning (Prerequisite: Graduate Statistics course)
- INFO-H 516 Cloud Computing for Data Science (Prerequisites: Graduate Database course)
- INFO-H 517 Visualization Design, Analysis, and Evaluation (Prerequisite: Programming experience)

Students may test out of LIS-S 511. Students do not receive credit toward their required 30 credit hours by testing out of a course. However, they may instead replace the course with a specialization course or approved elective.

Specialization + Elective Courses (12 credits)

Specialization Courses

- TESM-T 562 Economics of Event Tourism (Fall)
- TESM-T 582 Applied Sport Event Research (Spring)
- TESM-T 598 Master's Consulting Project (Summer)

Elective Courses

- INFO-B 505 Informatics Project Management
- INFO-H 518 Deep Learning Neural Networks
- INFO-H 519 Natural Language Processing with Deep Learning
- INFO-H 695 Thesis/Project in Applied Data Science (MS Thesis students only)
- INFO-I 575 Informatics Research Design
- INFO-I 595 Professional Internship
- INFO-I 698 Research in Informatics (Independent Study)
- INFO-P 502 Modeling Crisis
- NEWM-N 510 Web Database Development

Thesis or Project

The Thesis/Project is available to highly motivated students ready to carry out publishable research. Students must prepare a prospectus and gain a commitment from a primary faculty advisor with research interests in data science by the end of the first semester. By the end of the second semester, students must complete a course on research design and methods (e.g., INFO-I 575 or LIS-S 506).

The thesis or project must be completed in two semesters or in a semester and summer. Thesis students register for a total of 6 credits and project students register for a total of 3–6 credits of INFO-H 695 Thesis/Project in Applied Data Science. Students are required to prepare and defend a research proposal with a timeline of deliverables in addition to the thesis or project.

Last updated: 3/2024

Bioinformatics

Bioinformatics

The M.S. in Bioinformatics is a 36-credit-hour program that integrates knowledge from informatics, computation, information systems, mathematics, biology and other related areas. Successful applicants are expected to have an introductory background in both informatics (or computer science) and biology.

The program may be completed in two years by a full-time student. Part-time study options are available for domestic students. However, international students and any students funded directly by the Luddy School of Informatics, Computing, and Engineering (in the form of an assistantship or fellowship) must complete the program in two years.

Degree Requirements

Required core courses (15 cr.)

- INFO-B 519 Introduction to Bioinformatics (3 cr.)
- INFO-B 528 Computational Methods for Analyzing High-Throughput Biological Data (3 cr.)
- INFO-B 556 Biological Database Management (3 cr.)
- INFO-B 573 Programming for Science Informatics (3 cr.)
- INFO-B 627 Seminar in Bioinformatics (3 cr.)

Advanced core courses (15 cr.)

- INFO-B 506 Biomedical Informatics
- INFO-B 518 Applied Statistical Methods for Biomedical Informatics
- INFO-B 529 Machine Learning in Bioinformatics
- INFO-B 536 Computational Methods for Biomedical Informatics
- INFO-B 585 Biomedical Analytics
- INFO-B 574 Next-Generation Sequencing Data Analysis
- INFO-B 619 Structural Bioinformatics
- INFO-B 636 Genomic Data Analytics and Precision Medicine
- INFO-B 646 Computational System Biology
- INFO-B 656 Translational Bioinformatics Applications

At most, one of the following courses can be counted as an advanced core course.

- INFO-B 535 Clinical Information Systems
- INFO-B 642 Clinical Decision Support Systems
- Other Health Informatics courses (advisor approval required)

Thesis, project, or electives (6 cr.)

Thesis track

- INFO-B 692 Bioinformatics Thesis (6 cr.)

Project track

- INFO-B 692 Bioinformatics Project (3 cr.)
- Elective (3 cr.)
  Students can take other graduate courses either within or outside Luddy.

Non-thesis or project track

- Elective (6 cr.)
  Students can take other graduate courses either within or outside Luddy
- Last updated: 3/2024

Computer Science

Computer Science

Develop the technical proficiency employers are seeking and enhance your ability to craft innovative solutions to complex, real-world computing challenges.

Effectively collaborate with other experts to turn your ideas into reality when you earn our master's degree in computer science. Increase your research options and job prospects, focusing on:

- Project management
- Communication
- Analytical skills highly valued in the industry

The coursework is divided into four categories: foundations, systems, computer science core, and the creativity requirement. For the creativity requirement, students can choose from several options, including courses in computer science, data science, human–computer interaction (HCI), an internship, and thesis or project.

Foundations (3 cr.)

Choose one:

- CSCI-B 501 Theory of Computing
- CSCI-B 503 Algorithms Design and Analysis (Fall and Spring)
- CSCI-B 505 Applied Algorithms

Systems (3 cr.)

Choose one:

- CSCI-P 536 Advanced Operating Systems (Spring)
- CSCI-P 538 Computer Networks (Fall)

Computer Science Courses (15 cr.)

Select four CSCI-B or CSCI-P courses at the 500 level or higher:

Data Science and AI

- CSCI-B 551 Elements of Artificial Intelligence
- CSCI-B 555 Machine Learning (INFO-H 515) (Fall)
- CSCI-P 558 Deep Learning (Spring)
- CSCI-B 561 Advanced Database Concepts (Fall)
- CSCI-B 565 Data Mining (Fall)
- CSCI-B#651 Natural Language Processing (Spring)#P:#CSCI-B 551 or CSCI-B 555 or INFO-H 515

Visual Computing

- CSCI-B 581 Advanced Computer Graphics
- CSCI-B 657 Computer Vision
- CSCI-P 583 Data Visualization (Spring)

Networks and Security

- CSCI-B 504 Introduction to Cryptography (Spring)
- CSCI-B 516 Engineering Cloud Computing (Fall and Spring)
- CSCI-P 538 Computer Networks (Fall)
- CSCI-P 539 Sensor Networks and the Internet of Things (Spring)
- CSCI-B 544 Security for Networked Systems
- CSCI-B 547 Systems and Protocol Security and Information Assurance
- CSCI-B 570 Wireless and Mobile Security (Spring)
- CSCI-B 577 Security Engineering (Fall)

Software Engineering

- CSCI-P 532 Object-Oriented Software Development (Spring)
- CSCI-P 565 Software Engineering I
- CSCI-P#566 Software Engineering II (P: CSCI-P 565) (Fall)
- CSCI-P 567 Software Quality Assurance (Fall)
- CSCI-P#632 Object-Oriented Software Management

Systems

- CSCI-B 534 Distributed Systems
- CSCI-B 543 Computer Architecture (Spring)
- CSCI-P 523 Programming Language Implementation P: CSCI-B 521
- CSCI-P 536 Advanced Operating Systems (Spring)
- CSCI-B 575 Quantum Computing and Applications (Fall)

Additional Computer Science Courses

- CSCI-B 501 Theory of Computing
- CSCI-B 505 Applied Algorithms
- CSCI-B 521 Programming Language Principles
- CSCI-B 522 Programming Language Foundations
- CSCI-B 541 Hardware System Design I
- CSCI-B 546 Malware Epidemic: Threat and Defense
- CSCI-B 555 Machine Learning
- CSCI-B 557 Music Information Processing: Audio
- CSCI-B 590 Topics in Computer Science
- CSCI-C 591 Research Seminar
- CSCI-B 599 Teaching in Computer Science
- CSCI-B 609 Topics in Algorithms and Computing Theory
- CSCI-B 649 Topics in Systems
- CSCI-B 659 Topics in Artificial Intelligence
- CSCI-G 901 Advanced Research
- CSCI-P 515 Specification and Verification
- CSCI-P 523 Programming Language Implementation
- CSCI-P 542 Hardware System Design II
- CSCI-P 556 Applied Machine Learning

May include an independent study:

- CSCI-Y 790 Graduate Independent Study
- CSCI-Y 791 Graduate Independent System Development

Creativity Requirement (9 cr.)

Choose from:

-
  - Computer Science (CSCI-B, CSCI-P)
  - Data Science *(see list below)*
  - Human–Computer Interaction *(see list below)*
  - CSCI-Y 798 Professional Practicum Internship

Up to 6 credit hours of:

- CSCI-Y 790 Graduate Independent Study
- CSCI-Y 791 Graduate Independent System Development
- CSCI-Y 792 Master's Thesis
- CSCI-Y 793 Master's Software Thesis
- INFO-H 695 Thesis/Project in Applied Data Science
- INFO-H 694 Thesis/Project in Human Computer Interaction

Data Science

- INFO-H 501 Introduction to Data Science
- INFO-H 611 Mathematical and Logical Foundations of Informatics (test-out available)
- LIS-S 511 Database Design (test-out available)
- PBHL-B 670 Introduction to Biostatistics in R (or#PSY 60000 Statistical Inference#or#INFO-B 518 Applied Statistical Methods for Biomedical Informatics
- INFO-H 515 Statistical Learning#(prerequisite: PBHL-B 670 or PSY 60000)
- INFO-H 516 Cloud Computing for Data Science#(prerequisites: graduate database course and programming experience)
- INFO-H 517 Visualization Design, Analysis, and Evaluation#(prerequisite: programming experience)
- INFO-H 518 Deep Learning Neural Networks
- INFO-P 502 Modeling Crisis
- LIS-S 506 Introduction to Research#or#INFO-I 575 Informatics Research Design
- NEWM-N 510 Web Database Development

Human-Computer Interaction

- INFO-H 541 Interaction Design Practice
- INFO-H 543 Interaction Design Methods
- INFO-H 561 Meaning and Form in HCI
- INFO-H 563 Psychology of HCI
- INFO-H 564 Prototyping for Interactive Systems
- INFO-H 565 Collaborative and Social Computing
- INFO-H 566 Experience Design for Ubiquitous Computing
- INFO-H 570 Tangible and Embodied Interaction
- INFO-I 575 Informatics Research Design
- INFO-H 581 Experience Design and Evaluation of Access Technologies
- INFO-H 582 UX Design Ethics
- INFO-H 583 Conversational User Interfaces

Thesis or Project

The Thesis/Project is available to highly motivated students ready to carry out publishable research. Students must prepare a prospectus and gain a commitment from a#primary faculty advisor #with research interests in computer science by the end of the first semester. By the end of the second semester, students must complete a course on research design and methods (e.g.# LIS-S 506, or#INFO-I 575), if indicated by the advisor. The thesis or project must be completed in two semesters or in a semester and summer. Thesis students register for a total of 6 credits, and project students register for a total of 3–

6 credits. Students must prepare and defend a research proposal with a timeline of deliverables in addition to the thesis or project.

Nonmajor Courses (not for credit)

- CSCI-A 521 Computing Tools for Scientific Research
- CSCI-A 538 Network Technologies and Systems Administration
- CSCI-A 548 Mastering the World-Wide Web
- CSCI-A 590 Topics in Programming
- CSCI-A 591 Introduction to Computer Science
- CSCI-A 592 Introduction to Software Systems
- CSCI-A 593 Computer Structures
- CSCI-A 594 Data Structures
- CSCI-A 595 Fundamentals of Computing Theory
- CSCI-A 596 Programming Languages
- CSCI-A 597 Introduction to Programming I

Other Computer Science Courses

- CSCI-T 599 Topics in Computer Science Education
- CSCI-Y 799 Computer Science Colloquium
- CSCI-Y 890 Thesis Readings and Research

Last updated: 3/2024

Human-Computer Interaction

Human-Computer Interaction (degree can be completed on campus or online)
Prepare to be immersed in a project-based, hands-on user experience environment. By earning a master's in HCI, you'll explore emerging field research, learning how to create effective interactive systems for companies in Indiana and worldwide.

Students in our professional, research-focused program collaborate with industry leaders on real-world projects. They gain valuable insight from faculty in human-centered design, social computing research, and the Internet of Things.

Through your classes and Capstone project, you'll develop the UX design and research skills essential for a professional career in the field.

Degree requirements for the in-person/hybrid program

Print-friendly Plans of Study

- Fall 2023 Admits
- Spring 2023 Admits
- Fall 2022 Admits
- Spring 2022 Admits
- Fall 2021 Admits

Required Core

- INFO-H 541 Interaction Design Practice
- INFO-H 543 Interaction Design Methods
- INFO-H 561 Meaning and Form in HCI
- INFO-H 563 Psychology of HCI
- INFO-H 564 Prototyping Interactive Systems

Required Selectives

Choose 3 from this list.

- INFO-H 517 Visualization Design, Analysis, and Evaluation
- INFO-H 565 Collaborative and Social Computing
- INFO-H 566 Experience Design for Ubiquitous Computing
- INFO-H 567 IoT Interface Design for Business Innovation
- INFO-H 570 Tangible/Embedded
- INFO-H 581 Experience Design and Evaluation of Access Technologies
- INFO-H 582 UX Design Ethics
- INFO-H 583 Conversational UI

Area of Emphasis in Digital MakingMS HCI students can pursue an area of emphasis in digital making by completing 9-12 credit hours of Media Arts and Science graduate-level sections that count towards 6 elective credits and 3-6 credits of selective courses in the HCI MS programs. The area of emphasis in digital making allows students to complement their HCI preparation with application development skills to produce interactive media experiences and environments, and explore their connections with local businesses as well as the national industry. This area of emphasis is particularly well-suited to HCI MS students with a solid programming background. The Media Arts and Science graduate-level sections available for this area of emphasis include:

- NEWM-N 501 Foundations of Digital Production
- NEWM-N 505 Advanced Issues in Emerging Media Environments
- NEWM-N 585 Experiential Innovation I – Advanced Visualization
- NEWM-N 585 Real-world Emerging Wearable Technology Applications for Enterprise Business
- NEWM-N 585 Motion Graphics

Open Electives

Recommended electives include:

- INFO-I 595 Professional Internship
- Any 500-level course on campus that complements your HCI background
- Any additional course from the selective list after the first three.

Students must check for prerequisites and course availability from the respective schools and departments.

Final Project

Capstone OptionAll HCI students must complete a final MS capstone project by registering for two courses: H680 HCI Professional Practice 1 and H681 HCI Professional Practice 2, taken in two consecutive semesters. Each course includes a formally scheduled in-class time that students must attend. Students will work on one comprehensive, final MS HCI project that extends throughout the two courses, i.e., in both fall and spring semesters. Students will receive an official grade at the conclusion of each course/semester. Incompletes are not permitted.Thesis OptionThe MS Thesis option is reserved for students who possess a demonstrated ability to carry out publishable empirical research. Qualified students must find a research-active faculty member willing to advise them on a thesis by the end of the second semester.Students taking the Thesis option must take and successfully pass I575 Informatics Research Design or an equivalent research methods course decided in concert with the thesis advisor by the completion of their first year. It is the student's responsibility to propose a thesis that can be completed within a two-semester timeline.

To do this, students MUST provide their primary thesis advisor with a full thesis proposal and outline that includes a timeline for the writing of the thesis.

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Luddy School of Informatics, Computing, and Engineering resources and social media channels

- Apply
- Schedule a Visit
- Twitter
- Facebook
- Instagram
- YouTube
- LinkedIn

The M.S. in Human-Computer Interaction is a 36-credit-hour program that integrates computing, usability, interface design, the social sciences and other disciplines in the design and development of user-friendly technologies, software and information systems.
As a graduate, you'll be well prepared for a career in private industry or academia, or for admission to the Ph.D. in Informatics program with a human-computer interaction specialization.
The program may be completed in two years by a full-time student. Part-time study options are available for domestic students. However, international students and any students funded directly by the Luddy School of Informatics, Computing, and Engineering (in the form of an assistantship or fellowship) must complete the program in two years.
A thesis or applied research project is required to complete your degree.

Plan of Study

Core (24 cr.)

- INFO H501 Introduction to Informatics (3 cr.)
- INFO H541 Interaction Design Practice (3 cr.)
- INFO H543 Interaction Design Methods (3 cr.)
- INFO H561 Meaning and Form in HCI (3 cr.)
- INFO H563 Psychology of HCI (3 cr.)
- INFO H564 Prototyping for Interactive Systems (3 cr.)
- INFO H590 Ubiquitous Computing (3 cr.)
- INFO H590 Social Computing (3 cr.)

Final Project or Thesis (6 cr.)

Final Project Option
All HCI students must complete a final project by registering for two courses: H680 HCI Professional Practice 1 (offered ONLY in the Fall) and H681HCI Professional Practice 2 (offered ONLY in the Spring). Each course includes a formally scheduled in-class time that students must attend. Students will work on one final project that extends throughout the two courses, i.e., in both fall and spring semesters. Students will receive an official grade at the conclusion of each course/semester. Students are encouraged to propose a project that can be realistically completed by the conclusion of H681, the Spring semester. Incompletes are NOT permitted.

Required Courses

- INFO H680 HCI Professional Practice 1 (3 cr.) – Required for Final Project
  Note: Pre-requisites: INFO H541, H561, H543, H563, and H564
- INFO H681 HCI Professional Practice 2 (3 cr.) – Required for Final Project
  Note: Pre-requisites: INFO H680

Thesis Option
The Thesis option is reserved for students who possess a demonstrated ability to carry out publishable empirical research. Qualified students must find a research-active faculty member willing to advise them on a thesis by the end of the second semester.
Students taking the Thesis option must take and successfully pass I575 Informatics Research Design by the completion of their first year. They should also take an additional statistics course prior to their final regular semester. As with the final project, an incomplete will NOT be permitted. It is the student's responsibility to propose a thesis that can be completed within a two-semester timeline. To do this, students MUST provide their primary thesis advisor with a full thesis proposal and outline that includes a timeline for the writing of the thesis.
Required Course

- INFO H694 HCI Thesis (6 cr.)

Electives (6 cr.)
his plan of study applies only to students enrolled in the 100% fully online HCI MS program.Semester offering may vary – check the campus registrar for most updated schedule of courses.Online courses are typically offered in 100% asynchronous mode (noted as WWW on the Registration page), with weekly paced activities, but no synchronous online meetings. At times, online courses may be scheduled in "Hybrid-Distance" mode, which means fully online but with required weekly online meetings at a schedule time. Check mode details when registering for courses.**Recommended course load for online students:** If you are a full-time graduate student, we recommend you to take no more than three graduate courses per semester. If you're already working full-time, we recommend you to take one or two courses per semester. On average, a graduate course of 3 credits requires approximately 9-12 hours of workload per week, including class attendance.

General Core (15 credits)

- INFO-H 541 Interaction Design Practice
- INFO-H 543 Interaction Design Methods
- INFO-H 561 Meaning and Form in HCI
- INFO-H 563 Psychology of HCI
- INFO-H 564 Prototyping for Interactive Systems

Specialized Selectives (15-21 credits)

- INFO-I 501 Introduction to Informatics
- NEWM-N 510 Web Database Concepts

- INFO-H 517 Visualization Design and Analysis
- INFO-H 565 Collaborative and Social Computing
- INFO-H 566 Experience Design for Ubiquitous Computing
- INFO-H 570 Tangible and Embodied Interaction
- INFO-I 575 Informatics Research Design
- INFO-H 581 Experience Design and Evaluation of Access Technologies
- INFO-H 582 UX Design Ethics
- INFO-H 583 Conversational User Interfaces
- INFO-I 590 Programming for Interaction Designers
- INFO-I 595 Professional Internship

Additional selectives may become available.

Open Electives (0-6 credits)

Any relevant online course (500 or higher).

- HERR Visual Design for User Interfaces
- INFO-B 505 Informatics Project Management
- INFO-H 554 Independent Study in HCI

Additional electives may become available.
Last Updated: 3/2024

Health Informatics

Health Informatics

The Master of Science in Health Informatics degree integrates health care, health information technology, informatics, and many other fields. Our students learn to analyze and protect patient data, and to improve the quality of medical care and make it more efficient.

Our 36-credit-hour program equips students to examine how patients use their health care information, and to the build the tools that make it easier to manage unstructured data and extract useful information. By learning how to appropriately utilize natural language processing and other tools, our graduates can improve clinical decision support, electronic health records management, and patient privacy.

You'll complete your health informatics master's degree with either a thesis or a project, which provides a practical solution to a health information problem.

Degree Requirements

The master's degree is 36 credit hours. It includes a health informatics core of seven courses, a professional or thesis track of three courses, and two electives.

Select electives that reflect your particular focus, whether it's data science, programming languages, or health information security. The right classes can help you acquire skills to develop home health software, or to specialize in clinical research informatics or become proficient in implementing health care information systems.

Health Informatics Core

- INFO-I 501 Introduction to Informatics
- INFO-B 505 Informatics Project Management
- INFO-B 518 Applied Statistical Methods for Biomedical Informatics
- INFO-B 530 Foundations of Health Informatics or DENT-R 978 Introduction to Health Information Technology in Dentistry
- INFO-B 535 Clinical Information Systems (prerequisite: INFO-B 530)
- INFO-B 581 Health Informatics Standards and Terminologies (prerequisite: INFO-B 530)
- INFO-B 642 Clinical Decision Support Systems (prerequisites: INFO-I 501 and INFO-B 535)

Professional Track

- INFO-B 583 Security and Privacy Policies and Regulations for Health Care (prerequisites: INFO-I 501 and INFO-B 530)
- INFO-B 626 Human Factors Engineering for Health Informatics (prerequisites: INFO-I 501 and INFO-B 535)
- INFO-B 584 Practicum in Health Information Technology or INFO-B 691 Thesis/Project in Health Informatics

Thesis Track

- INFO-B 585 Biomedical Analytics
- LIS-S 506 Introduction to Research or INFO-I 575 Informatics Research Design
- INFO-B 691 Thesis/Project in Health Informatics

Approved Electives

- DENT-R 957 Introduction to Research in Oral Biology
- INFO-B 512 Scientific and Clinical Data Management (Health Informatics)
- INFO-B 513 The Design, Implementation, and Evaluation of Electronic Health Record Systems (Corequisite: INFO-B 642) (spring)
- INFO-B 529 Machine Learning in Bioinformatics
- INFO-B 536 Computational Methods for Biomedical Informatics
- INFO-B 551 Independent Study (including summer)
- INFO-B 573 Programming for Science Informatics
- INFO-B 582 Health Information Exchange (fall)
- INFO-B 584 Practicum in Health Information Technology (including summer)
- INFO-B 585 Biomedical Analytics (fall)
- INFO-B 605 Social Foundations of Informatics (summer)
- INFO-B 626 Human Factors Engineering for Health Informatics (prerequisites: INFO-I 501 and INFO-B 535)
- INFO-B 641 Business of Health Informatics
- INFO-B 643 Natural Language Processing for Biomedical Records and Reports (spring)
- INFO-B 644 Consumer Health Informatics (spring)
- INFO-H 516 Cloud Computing for Data Science
- INFO-H 541 Interaction Design Practice (HCI)
- INFO-H 543 Interaction Design Methods (HCI)
- INFO-I 595 Internship

Other elective courses are possible upon approval of the program director. Some elective courses may have prerequisites. Students should check with the instructor before enrolling.

Last updated: 3/2024

MS Degree Programs

MS Degree Programs
Given the rapid and apparently unlimited growth of this new field at all levels of competence, each of the master's degree programs serves students who need education in the use of information technologies to enhance their job performance or employment prospects.

The Luddy School of Informatics, Computing, and Engineering offers **Master of Science** degrees in:

- Bioinformatics
- Computer Science
- Health Informatics
- Human-Computer Interaction
- Media Arts and Science

All Master of Science degrees require 36 credits, including the completion of common graduate core courses.

To learn more about the M.S. degree programs review the following information:

- Academic Regulations
- Admission to the M.S. Program
- Financial Assistance

Master of Library and Information Science

Master of Library and Information Science

Information literacy, metadata management, and other modern challenges are the focus of what we study as experts in library science and data technology.

Now you can expand your skills without putting your life on hold, by earning your Master of Library Science (M.L.I.S.) degree online through at the Luddy School of Informatics, Computing, and Engineering at IU Indianapolis. Graduates join a community of highly regarded professionals who provide creative, data-driven ideas that empower library patrons, corporations, civic groups, and our communities.

IU Indianapolis' Department of Library and Information Science is 100% online and specializes in fostering collaborative learning from a distance. We create an environment that allows you to work from home or wherever you need to be.

Our Master of Library Science, the entry degree for a professional librarian, is accredited by the American Library Association (ALA-MLS). Universally required for professionals in academic libraries, the MLS is essential for leadership in public libraries and provides valuable management skills.

Degree Requirements (39 credits) - Generalist

Foundation (6 cr.)

- LIS-S 500 Methods and Tools for the Information Profession
- LIS-S 507 Tools and Technologies for the Information Professions

Specialization Core (9 cr.)

- LIS-S 501 Information Sources and Services
- LIS-S 502 Acquisitions and Management of Knowledge and Information
- LIS-S 503 Organization and Representation of Knowledge and Information

Specialization Core: Research and Evaluation (3 cr.)

Choose one:

- LIS-S 505 Evaluation of Information Sources and Services
- LIS-S 506 Introduction to Research

Specialization Core: Management (3 cr.)

Choose one:

- LIS-S 552 Academic Library Management
- LIS-S 553 Public Library Management
- LIS-S 555 Digital Services Management

Open Electives (18 cr.)

Choose 18 credit hours of coursework.

Plans of Study (Specializations)

Each specialization lists electives. However, these are recommendations or suggestions. Any course not listed under Foundations or Specialization Core for your specialization can be an elective. Pre-requisites required for a course but not for a specialization will count towards a student's electives.

- Generalist (No Specialization)
- Academic Librarianship Specialization
- Archives Management Specialization
- Digital Curation Specialization
- Facilitated Learning Specialization
-
- Public Librarianship/Adult Services Specialization
- School Library Specialization
- Technical Services Specialization
- Youth Services Specialization

Last updated: 3/2024

Applied Data Science with User Experience Specialization

Applied Data Science with User Experience Specialization

By earning an M.S. in Applied Data Science with a specialization in UX design, you'll understand client-server application development and the ethical and professional management of informatics projects. Through your classes under the direction of our highly regarded faculty, gain competency in the application of human-computer interaction (HCI) theory and user-centered practices to user experience research and design.

The plan of study is 30 credit hours. It includes eight core courses, one specialization course, and one elective course. Transfer students may be able to transfer in approved graduate courses from an accredited institution.

F-1 students can only take one online course per semester. They must take a minimum of 8 credit hours per semester; the exception being in their final semester. These limitations apply to fall and spring semesters but not summer sessions.

Applied Data Science Core Courses (18 credits)

- INFO-I 501 Introduction to Informatics
- LIS-S 511 Database Design
- INFO-H 510 Statistics for Data Science
- INFO-H 515 Statistical Learning (Prerequisite: Graduate Statistics course)
- INFO-H 516 Cloud Computing for Data Science (Prerequisites: Graduate Database course)
- INFO-H 518 Deep Learning Neural Networks

Students may test out of LIS-S 511. Students do not receive credit toward their required 30 credit hours by testing out of a course. However, they may instead replace the course with an approved elective.

UX Design Core Courses (6 credits)

- INFO-H 541 Interaction Design Practice
- INFO-H 543 Interaction Design Methods

UX Design Specialization Course (Pick one, 3 credits)

- INFO-H 517 Visualization Design, Analysis, and Evaluation (Prerequisite: Programming experience)
- INFO-H 561 Meaning and Form in HCI
- INFO-H 563 Psychology of HCI
- INFO-H 564 Prototyping Interactive Systems

Elective Courses (3 credits)

- INFO-B 505 Informatics Project Management
- INFO-H 517 Visualization Design, Analysis, and Evaluation (Prerequisite: Programming experience)
- INFO-H 519 Natural Language Processing with Deep Learning
- INFO-I 575 Informatics Research Design
- INFO-I 595 Professional Internship
- INFO-I 698 Research in Informatics (Independent Study)
- INFO-P 502 Modeling Crisis
- NEWM-N 510 Web Database Development

Last updated: 3/2024

Applied Data Science with Crisis Informatics Specialization

Applied Data Science (with Crisis Informatics Specialization)

In a crisis, information is a critical resource. It's what drives the response—analyzing scope, identifying resources, and deploying responders. Informatics informs the planning and preparedness needed to reduce the impact of a flood, tornado, or other disaster. To anticipate, mitigate, and manage a crisis, you need data. With the right skills, you can use that data to provide useful information and potentially life-saving knowledge.

Our trailblazing program is the first to offer a Master of Science in Applied Data Science with a specialization in Crisis Informatics. You'll learn methods of data mining, how to transform large data sets into usable knowledge, and ways to represent information visually.

This is a 30-credit hour program that may be completed in three semesters and one summer (1 ½ years).

Fall Admissions

Fall Year 1

- LIS-S 511 Database Design (3 cr.)
- PSY 60000 Statistical Inference (3 cr.)
- SPEA-J 520 Mapping and Analysis for Public Safety (3 cr.)

Spring Year 1

- INFO-I 501 Introduction to Informatics (3 cr.)
- INFO-H 515 Statistical Learning (3 cr.)
- INFO-H 516 Cloud Computing for Data Science (3 cr.)

Summer

Select one:

- INFO-H 695 Thesis/Project in Applied Data Science (3 cr.)
- INFO-I 595 Professional Internship (3 cr.)

Fall Year 2

- INFO-H 517 Visualization Design, Analysis, and Evaluation (3 cr.)
- INFO-P 502 Modeling Crisis (3 cr.)

Select one:

- GEOG-G 535 Environmental Remote Sensing (3 cr.)
- SPEA-J 524 Emergency Management (3 cr.)

Last updated: 3/2024

Bioinformatics

The Ph.D. in Bioinformatics is a 90-credit-hour program that includes core courses, research rotations, the choice of a minor, qualifying examinations, and a dissertation. Our curriculum provides a balance in wide-ranging fields, cutting-edge computing technology, state-of-the-art informatics skills, innovative research and scholarly activities, bioethics, effective teaching, and intellectual property, preparing graduates to succeed in post-doctoral careers. In addition to research and analytics, you'll learn how to:

- Perform novel research projects
- Publish original articles
- Present inspiring findings at national conferences
- Create visual representations of complex data
- Design database systems
- Write effective grant proposals

Plan of study

Prerequisite courses

Students may test out of these.

For students with a biology background:

- INFO-B 573 Programming for Chem/Life Science

For students with a computing background:

- K322 Genetics and Molecular Biology and K324 Cell Biology or
- BIOL 507 Molecular Biology

Qualifying courses (15 cr.)

- INFO-B 519 Introduction to Bioinformatics (3 cr.)
- INFO-B 529 Machine Learning in Bioinformatics (3 cr.)
- INFO-B 518 Applied Statistical Methods for Biomedical Informatics (3 cr.)
- INFO-B 556 Biological Database Management (3 cr.)
- INFO-B 528 Computational Methods for Analyzing High-Throughput Biological Data (3 cr.)

Required core courses (12 cr.)

- CSCI 59000 Algorithms in Bioinformatics (3 cr.)
- INFO-B 627 Advanced Seminar I – Bioinformatics (3 cr.)
- INFO-B 637 Advanced Seminar II – Bioinformatics (3 cr.)
- INFO-I 790 Independent Study/Rotation (3 cr.)

Elective core courses (15 cr.)

Students will select five of these courses.

- INFO-B 506 Biomedical Informatics
- INFO-B 619 Structural Bioinformatics (3 cr.)
- INFO-B 646 Computational System Biology (3 cr.)
- INFO-B 656 Translational Bioinformatics Applications (3 cr.)
- INFO-B 536 Computational Methods for Biomedical Informatics (3 cr.)
- INFO-B 636 Genomic Data Analytics and Precision Medicine (3 cr.)
- MGEN-G 788/INFO-I 590 Next Generation Sequencing (3 cr.)
- Other Bioinformatics courses (advisor approval required)

At most, one of the following courses can be counted toward the elective core.

- INFO-B 535 Clinical Information Systems (3 cr.)
- INFO-B 642 Clinical Decision Support Systems (3 cr.)
- INFO-B 585 Analytics of Biomedical Data (3 cr.)
- Other Health Informatics courses (advisor approval required)

Minor (minimum 12 cr.)

All students will be required to have an appropriate minor outside or partially inside the School of Informatics and Computing at IU Indianapolis for a minimum 12.0 credit hours. Minors will be selected with the advisor's recommendation. Some appropriate minors would include biology, chemistry, cognitive psychology, computer science, information science, or statistics. In all cases, the number of hours to be included in the minor will be consistent with the requirements of the unit granting the minor. Some of the courses included in the minor may also count toward the student's methodology or other requirements.

Electives

There are no minimum or maximum credits. Students may take other electives (subject to approval) at the graduate level as needed for their specific research.

Written qualifying examination

All students will take a written qualifying examination that covers the core courses (CORE A and B). The examination will be set by a group of faculty who are familiar with the content of the core courses. Examinations will be offered in August. Examinations must be completed by the beginning of the student's fourth year in the program but can be completed before that time when the core courses are completed. Students who do not successfully complete the examination can retake the examination a second time.

Oral qualifying examination

1. The oral examination will take place after the student successfully passes the written examination. Students must pass both the written and oral examination before passing on to candidacy. Only two attempts to pass the oral examination will be allowed.
2. The oral examination will be based on the student's response to the written examination and any material from the core courses.

Dissertation proposal

This is an oral review that covers in-depth knowledge of the student's primary research area and dissertation proposal. The research proposal for dissertation must be approved by the student's research committee. That committee may have the same membership as the program committee or the students may choose different members. The advisor for the dissertation will be a faculty member in the Luddy School of Informatics, Computing, and Engineering at IU Indianapolis and a member of the graduate faculty. At least one the three members of the committee will be based outside the school. The student will defend the thesis proposal at a public colloquium in the school. The review should be completed within one year after passing the Qualifying Examinations.

Dissertation (30 cr. minimum)

- INFO-I 890 Thesis/Project in Bioinformatics (1-6 cr.)

Last updated: 3/2024

Computer Science

Computer Science Ph.D

Degree Requirements

A total of 90 credit hours of graduate-level coursework is required for the Ph.D. in Computer Science from IU's Luddy School of Informatics, Computing, and Engineering in Indianapolis.

Ph.D. candidates must take at least 24 credit hours of courses in computer science at or above the 500 level. Courses for nonmajors (CSCI-A) do not count.

Six courses, from the list below, must be completed each with a minimum grade of B:

Foundations of Computing
Select at least one.

- CSCI-B 501 Theory of Computing
- CSCI-B 502 Computational Complexity
- CSCI-B 503 Algorithms Design and Analysis

Computer Systems
Select at least one.

- CSCI-B 534 Distributed Systems
- CSCI-P 536 Advanced Operating Systems
- CSCI-P 538 Computer Networks

Select at least one from either 3 or 4
Programming Languages

- CSCI-B 521 Programming Language Principles
- CSCI-B 522 Programming Language Foundations
- CSCI-P 523 Programming Language Implementation

Intelligent Systems

- CSCI-B 551 Elements of Artificial Intelligence
- CSCI-B 555 Machine Learning
- CSCI-B 561 Advanced Database Concepts
- CSCI-B 565 Data Mining

A grade average of B (3.0) is required for the 24 credit hours of required computer science courses. This is in addition to the Graduate School's requirement of a B (3.0) average for all courses taken.

Minor Area Requirement
The Ph.D. requires a 12-credit minor unless the student is a dual major with another department. There are three options to satisfy the minor requirement:

1. An external minor awarded by another Indiana University department or graduate program on campus that the Computer Science Program approves.
2. An individualized interdisciplinary minor: at least 12 credits spanning at least two Indiana University departments/degree programs in Indianapolis, or 12 credits from programs within the Luddy School in Indianapolis which fall outside the student's major. The minor courses should be recommended by the student's advisory committee and approved by the Computer Science Program in advance of any course work.

Qualifying Examination
The qualifying examination is given by the first semester of the student's third year in the program. This examination is administered by the advisory committee and is expected to have a written and an oral component. A student must have completed the 24 credit hours of courses in computer science as specified in the Computer Science Course Requirements before taking the qualifying exam. If failed, the exam may be retaken once, by the end of the third year. Students who fail the second exam cannot continue in the program.

Dissertation Defense
A written elaboration of significant original research must be successfully presented to the student's research committee in a public oral defense.

last updated: 3/2024

Data Science

The **Ph.D. in Data Science** is a 90-credit-hour program that prepares students to address data research problems with inventive and creative solutions that generate new knowledge through studies that demonstrate a high degree of intellectual merit and the potential for broader impact. The Ph.D. curriculum also prepares students to make research contributions that advance the theory and practice of data science.

Plan of Study
Data Science Core (24 cr.)
- INFO I501 Introduction to Informatics (3 cr.)
- LIS #S511 Database Design (3 cr.) or CSCI 54100 Database Systems (3 cr.)
- STAT 51100 Statistical Methods I or higher (3 cr. requires approval)
- INFO H515 Data Analytics (3 cr.) or CSCI 57300 Data Mining (3 cr.)
- INFO H516 Applied Cloud Computing for Data Intensive Sciences (3 cr.) or CSCI 59000 Cloud Computing (3 cr.)
- INFO H517 Visualization Design, Analysis, and Evaluation (3 cr.) or CSCI 55200 Data Visualization (3 cr.)
- LIS S541 Information Policy (3 cr.)
- INFO I575 Informatics Research Design (3 cr.)

Methods Courses (18 cr.)
- CSCI 52000 Computational Methods in Analysis (prerequisites: CSCI 23000 Computing II or equivalent and MATH 35100 Elementary Linear Algebra OR MATH 511 Linear Algebra and Applications)
- CSCI 58000 Algorithm Design, Analysis, and Implenmentation
- NURS-L 650 Data Analysis for Clinical and Administrative Decision-Making (3 cr.)
- NURS-R 612 Interpretive Data Analysis (2 cr.)
- PBHL-B 515 Biostatistics Practicum (3 cr.)
- PBHL-B 527 Introduction to Clinical Trials (3 cr.)
- PBHL-B 546 Applied Longitudinal Data Analysis (3 cr.)
- PBHL-B 571 Biostatistics Method I: Linear Models in Public Health (4 cr.)
- PBHL-B 621 Advanced Statistical Computing (3 cr.)
- PBHL-B 636 Advanced Survival Analysis (3 cr.)
- PBHL-B 646 Advanced Generalized Linear Models (3 cr.)
- PSY 60000 Statistical Inference (3 cr.)
- PSY 60100 Experimental Design (3 cr.)
- PSY 60800 Measurement Theory and Interpret Data (3 cr.)
- PSY 64000 Survey of Social Psychology I (3 cr.)
- PSY-I 643 Field Methods & Experimentation (3 cr.)
- SOC-R 551 Quantitative Methods (3 cr.)
- SOC-R 559 Intermediate Soc. Statistics (3 cr.)
- STAT 51100 Statistical Methods 1 (3 cr.)
- STAT 51200 Applied Regression Analysis (3 cr.)
- STAT 51600 Basic Probability Applications (3 cr.)

- STAT 51900 Introduction to Probability (3 cr.)
- STAT 52100 Statistical Computing (3 cr.)
- STAT 52200 Sampling and Survey Techniques (3 cr.)
- STAT 52400 Applied Multivariate Analysis (3 cr.)
- STAT 52500 Generalized Linear Model (3 cr.)
- STAT 52800 Mathematical Statistics I (3 cr.)
- STAT 52900 Applied Decision Theory and Bayesian Statistics (3 cr.)
- STAT 53600 Introduction to Survival Analysis (3 cr.)
- STAT 61900 Probability Theory (3 cr.)
- STAT 62800 Advanced Statistical Inference (3 cr.)

May include up to 6 credit hours of INFO-I 790 Informatics Research Rotation.

Specialization (18 cr.)

1. Disciplinary Affinities (0–6 cr.)
2. Minor (12–18 cr.)

The student must complete a minor within a domain appropriate to the chosen specialization and/or research area. All courses must be graduate-level and taken outside the Data Science program.

Qualifying Examination, Written and Oral

A student must successfully complete a written and oral qualifying examination before the fifth semester of the program. The written exam has a breadth part and a depth part. The breadth part covers the program's core courses. The depth part additionally covers material from the student's research.

The oral exam takes place shortly after the student passes the written exam. The oral exam is based on the student's response to the written exam and the core courses. The both the written and oral exams are prepared and evaluated by faculty in the school who are familiar with the content of the core courses.

The student must pass both the written exam and the oral exam before advancing to candidacy. The student may retake once either the written exam or oral exam, but not both, if they do not pass that part on the first attempt. For further details, consult with the data science program director.

Dissertation (30 cr.)

A dissertation is a written elaboration of original research that makes creative contributions to the student's chosen area of specialization. The student will enroll multiple times in INFO I890 Thesis Readings and Research (1-12 cr.) while completing the dissertation. All requirements must be completed within seven years of passing the qualifying exams. The dissertation process includes the following components:

- **Proposal:** This is an in-depth oral review undertaken by students who have made significant progress in their research. The proposal will be defended at a public colloquium. The student must complete the proposal within one year of passing the qualifying exams.
- **Defense:** The student must defend his or her dissertation in an open seminar scheduled when doctoral research is almost complete.

Last updated: 3/2024

Health Informatics

Degree Requirements

The Ph.D. in Health and Biomedical Informatics specialization is a 90-credit-hour program that integrates knowledge from informatics, health care, health information technology, and other disciplines. The program includes core courses, research rotations, your choice of minor, qualifying examinations, and a dissertation.

Year 1

Fall

- INFO I501 Introduction to Informatics
- INFO B530 Foundations of Health Informatics
- INFO I575 Informatics Research Design

Spring

- INFO B505 Project Management –for HI
- INFO B518 Statistics for Biomedical Informatics
- INFO B535 Clinical Information Systems

Summer

- INFO I790 Independent Study/Rotation or elective

Year 2

Fall

- GRAD G660 Clinical Research Methods
- INFO B581 Health Informatics Standards & Terminology
- INFO B585 Biomedical Data Analytics

Spring

- PBHL B562 Biostatistics for Public Health II
- INFO B642 Clinical Decision Support Systems
- INFO B667 Seminar in Interprofessional Collaboration

Summer

- Elective / minor course

Year 3

Fall

- INFO-B 668 Advanced Seminar in BioHealth Informatics
- Research Rotation or INFO I890 Dissertation
- Elective or minor course

Spring

- INFO I890 Dissertation

Summer

- INFO I890 Dissertation

Year 4

Fall

- INFO I890 Dissertation

Spring

- INFO I890 Dissertation

Summer

- INFO I890 Dissertation

Electives

Choose a minimum of 2 (maximum of 5) courses.

- INFO-B 512 Scientific and Clinical Data Management (Bioinformatics)
- INFO-B 551 Independent Study (including summer)
- INFO-B 513 The Design, Implementation, and Evaluation of Electronic Health Record Systems (Corequisite: INFO-B 642)
- INFO-B 573 Programming for Science Informatics
- INFO-B 582 Health Information Exchange
- INFO-B 585 Biomedical Analytics
- INFO-B 605 Social Foundations of Informatics (summer)
- INFO-B 626 Human Factors Engineering for Health Informatics (prerequisites: INFO-I 501 and INFO-B 535)
- INFO-B 641 Business of Health Informatics
- INFO-B 643 Natural Language Processing for Biomedical Records and Reports
- INFO-B 644 Consumer Health Informatics
- INFO-H 541 Interaction Design Practice (HCI)
- INFO-H 543 Interaction Design Methods (HCI)

Other elective courses are possible upon approval of your faculty advisor.

Human-computer interaction courses

- INFO H563 Psychology of Human-Computer Interaction
- INFO H564 Prototyping for Interactive Systems

Graduate school courses

- GRAD 610 Topic in Translation and Implementation of Research
- GRAD 661 Clinical Trials
- GRAD 653 Introduction to Applied Statistic Methods

Minor

All students will be required to have an appropriate minor outside or partially inside the school. Minors will be selected with the advisor's recommendation. The selected minor should be appropriate to the student's choice of subdiscipline within health informatics. Some appropriate minors include public health, dental informatics, cognitive psychology, communication sciences, biostatistics, and clinical research science. In all cases, the number of hours to be included in the minor will be consistent with the requirements of the unit granting the minor.

Qualifying examinations

Written exam

All students will take a written qualifying examination that covers the (1) core courses of the Master In Health Informatics Program and (2) critical review of Health Informatics Research. The examination will be set by a group of faculty who are familiar with the content of the core courses. Examinations will be offered in August. Examinations must be completed by the beginning of the student's third year in the program, but can be completed before that time when the core courses are completed. Students who do not successfully complete the examination can retake the examination a second time.

Oral exam

The oral examination will take place after the student successfully passes the written exam. Students must pass both the written and oral exam before passing on to candidacy. Only two attempts to pass the oral examination will be allowed.

The oral exam will be based on the student's response to the written exam and any material from the core courses.

Dissertation

Proposal (Required)

This is an oral exam that covers in-depth knowledge of the student's primary research area and dissertation proposal. The research proposal for dissertation must be approved by the student's research committee. That committee may have the same membership as the program committee, or the student may choose different members. The advisor for the dissertation will be a faculty member in the School of Informatics and Computing and a member of the graduate faculty. At least one of the three members of the committee will be based outside the school. The student will defend the thesis proposal at a public colloquium in the school. The examination should be completed within one year after passing the Qualifying Examinations. Only two attempts to pass this examination will be allowed.

Dissertation (21 to 30 cr.)

A written elaboration of significant original research, which must be successfully presented to the research committee in a public defense as described in the Graduate School Bulletin.

last updated: 3/2024

Human-Computer Interaction

The **Ph.D. in Human-Computer Interaction** specialization is 90-credit-hour program that integrates computing, usability, interface design, the social sciences and other disciplines in the design and development of user-friendly technologies, software and information systems.

The program includes core courses, research rotations, your choice of minor, qualifying examinations and a dissertation.

HCI Core (18 cr.)

- INFO H541 Interaction Design Practice
- INFO H564 Prototyping for Interactive Systems
- INFO H624 Advanced Seminar I in Human-Computer Interaction
- INFO H634 Advanced Seminar II in Human-Computer Interaction
- Select two HCI Research Area Selectives:
  - INFO I501 Introduction to Informatics
  - INFO H517 Visualization Design, Analysis, and Evaluation
  - INFO H543 Interaction Design Methods*(take online or in Year 3 if scheduling conflicts)*
  - INFO H563 Psychology of Human-Computer Interaction

- INFO H565 Collaborative and Social Computing
- INFO H566 Experience Design for Ubiquitous Computing
- INFO H567 Internet-of-Things Interface Design for Business Innovation
- INFO H570 Experience Design for Tangible and Embodied Systems
- INFO H581 Experience Design and Evaluation of Access Technologies
- INFO H582 User Experience Design Ethics
- INFO H583 Conversational User Interfaces: Experience Design and Applications

Methods Courses (18 cr.)

- INFO I575 Informatics Research Design
- INFO I790 Informatics Research Rotation (Taken three times)
- Two Methods Electives:
  - PSY 608 Measurement Theory and Interpret Data
  - PSY 640 Survey of Social Psychology I
  - PSY 655 Cognitive Development
  - PSY-I 643 Field Methods & Exper
  - ANTH-E404 Field Meth in Ethnography
  - COM 501 Qualitative Research
  - COM 502 Applied Qualitative Research Methods
  - EDU 520 Strategies for Educational Inquiry
  - EDU 611 Qualitative Inquiry in Education
  - NURS-L 650 Data Ana Clinical & Admin Dec.-Making
  - NURS-R 612 Interpretive Data Analy (2 cr.)
  - SOC-R 551 Quantitative Methods – Sociology
  - SOC-R 551 Quantitative Methods Sociology
  - SOC-R 559 Intermediate Soc Statistics
  - STAT 511 Statistical Methods 1
  - STAT 512 Applied Regression Analysis
  - STAT 516 Basic Probability Appl.
  - STAT 519 Intro to Probability
  - STAT 521 Statistical Computing
  - STAT-522 Sampling and Survey Techniques
  - STAT 524 Applied Multivariate Analysis
  - STAT 525 Intermediate Stat Methodology
  - STAT 529 Applied Dec Theory and Bayesian Stat
  - STAT 619 Probability Theory

Specialization (18 cr.)

- Disciplinary Affinities (0-6 cr.)
- Minor (12-18 cr.)

You must complete a minor within a domain appropriate to your choice of specialization and/or research area. All courses must be graduate-level and outside the HCI program.

Qualifying Examinations

1. **Written Exam** – You must successfully complete a written qualifying examination by the end of the program's second year. The exam is established by faculty and covers subject matter taken in the program's core courses. The exam may be retaken once.
2. **Oral Exam –** An oral examination takes place within weeks after successful completion of the written exam. You must pass both the written and oral exam before passing on to Ph.D. candidacy. The oral exam is based on the student's response to the written exam and core course material. The exam may be retaken once.

Dissertation (30 cr.)

A dissertation is a written elaboration of original research that makes creative contributions to your chosen area of specialization. Students will enroll multiple times in INFO I890 Thesis Readings and Research (1-12 cr.) as you work to complete your dissertation. All requirements must be completed within seven years of passing the qualifying exams. The dissertation process includes the following components:

1. **Proposal:** The research proposal for the dissertation must be approved by the student's research committee. The student will defend the dissertation proposal at a public colloquium in the school. The review should be completed within one-year after passing the Qualifying Examinations.
2. **Defense:** A written elaboration of significant original research must be successfully presented to the research committee in a public defense as described in the Graduate School Bulletin.

Last updated: 3/2024

PhD Degree Programs

Ph.D. Programs

The Luddy School of Informatics, Computing, and Engineering, the first of its kind in the country, was created as a place where innovative multidisciplinary programs could thrive, a program where students can apply the skills of technology to a range of other fields.

All Ph.D. candidates must meet with their academic and/or research advisor for course selection and plan of study.

The School of Informatics offers a **Doctoral (Ph.D.)** program with specializations in:

- Bioinformatics
- Computer Science
- Data Science
- Health and Biomedical Informatics
- Human-Computer Interaction

Graduate Degree Programs

Graduate Programs

The Luddy School of Informatics, Computing, and Engineering offers **Master of Science** degrees in:

- Applied Data Science (30 credit hours)
- Bioinformatics (36 credit hours)
- Computer Science (30 credit hours)
- Health Informatics (36 credit hours)

- Human-Computer Interaction (36 credit hours)
- Library and Information Science (39 credit hours)

The Luddy School of Informatics, Computing, and Engineering also offers a **Doctoral (Ph.D.)** program with specializations in:

- Bioinformatics
- Computer Science
- Data Science
- Health Informatics
- Human-Computer Interaction
- Data Science

All Ph.D. candidates must meet with their academic and/or research advisor for course selection and plan of study.

Finally, the Luddy School of Informatics, Computing, and Engineering offers a number of **Graduate Certificate Programs**:

- Archives Management
- Clinical Informatics
- Human-Computer Interaction
- Health Information Management and Exchang
- Health Information Security
- Public Health Professionals
- School Library Certificate

Last updated: 3/2024

Certificate in Human-Computer Interaction

Certificate in Human-Computer Interaction
Graduates of the Human-Computer Interaction Graduate Certificate program will demonstrate expertise in the following core competencies essential to success:

1. Basic HCI theory, terms, principles, and conceptual models
2. User-centered design theory and practices related to interaction design
3. HCI design and development processes and life-cycle
4. User profiling to interaction design (needs and requirements)
5. System requirements and product assessments
6. Interface design principles and processes
7. Product usability evaluations and testing methods
8. The purpose of the graphic user interface
9. Usability theory, terms, and the applied techniques
10. Principles of the interface design and prototyping processes
11. Interface grids and typographical devices
12. Information architecture and content management
13. Classic user testing theory and tools
14. Advanced user requirements and profiling
15. Interface design standards / guidelines for cross cultural and disabled users
16. Interaction design styles and choosing interaction devices and elements
17. Develop an evaluative strategy; planning who, what, when, and where
18. Decide how to collect data and prepare for the final evaluation
19. Analysis and interpretation of the evaluation data
20. Inspect a user interface, including a range of evaluative processes
21. Prototype design basics: theory and practice; including basic terms
22. Psychological and behavioral science of HCI
23. Cognitive architecture, memory, problem-solving, mental models, perception, and action related to HCI
24. Impact the design and testing of interactive technologies

Graduates will also be able to apply HCI theory and principles to product development:

1. Apply HCI principles and a user-centered approach to interaction design
2. Analyze user needs and requirements
3. Design and develop prototypes based on user assessments (needs and requirements), while applying HCI principles and models.
4. Apply evaluation and usability testing methods to interactive products to validate design decisions
5. Develop pre-design and post-design usability testing techniques on the developed Web site
6. Assess user needs and requirements
7. Categorize, design, and develop information in proper architectural structures
8. Create interface design prototypes based on a range of design principles and user data, and user assessments
9. Apply prototype principles and a user-centered approach to interaction design
10. Apply evaluation and usability testing methods to prototypes to validate design decisions and to the Web product to validate design decisions using: a) Classic user testing, and b) Heuristic inspection
11. Analyze test data and write a comprehensive report on the product development process of their redesigned Web site, i.e. of the stages of pre-design, design, and post-design, testing, and data analysis
12. Implement a HCI research proposal, including research questions, collecting the relevant literature and methodology
13. Develop a general framework, with a hierarchy of concepts and topics, including a refinement of the research question
14. Understand and apply the various research methods regarding qualitative and quantitative data

Last updated: 02/04/2014

Certificate in Informatics in Health Information Management and Exchange

Certificate in Informatics in Health Information Management and Exchange
Individuals graduating from this program will support the collection, management, retrieval, exchange, and/or analysis of information in electronic form, in healthcare and public health organizations.

1. Understanding Technology and Methodologies for processing data, information and knowledge in Health Care
    - Explain concepts of information and communication technologies.
    - Elaborate basic informatics terminology like data, information, knowledge, hardware, software, networks, information systems, information systems management, databases.
    - Implement standards and terminologies for documenting health events and exchanging protected health information.
2. Information Literacy for Health Care
    - Determine the nature and extent of the information needed to build effective health information exchange services.
    - Propose infrastructure needed for health information exchange effectively and efficiently.
    - Evaluate information and its sources critically and incorporates selected information into health information exchange services.
    - Evaluate outcomes of health information exchange services on health care outcomes.
3. Information Management
    - Verbalize the importance of health information exchange to health care outcomes.
    - Have knowledge of various types of health information exchange services.
    - Assure confidentiality of protected patient health information when using health information exchange.
    - Assure access control in the use of health information exchange.
    - Assure the security of health information exchange.
    - Possess the skills as outlined in supportive functions component of the HL7 model applicable to health information exchange.
    - Understand the principles upon which organizational and professional Health Information System for providers and consumers are based.

Last updated: 02/04/2014

Certificate of Informatics in Health Information Security

Certificate of Informatics in Health Information Security
Graduates of the Graduate Certificate in Informatics in Health Information Security program will be qualified to serve as institutional/organizational information privacy or security officers:

1. Understanding Technology and Methodologies for Processing Information in Healthcare:
    - Explain concepts of information and communication technologies
    - Analyze network service management (i.e. DNS/DHCP, web, email, spam filtering, resource sharing, database, directory services and authentication), network communication and security (i.e. network devices, firewalls, intrusion detection systems, and incident response/forensics), and administration (i.e. shell scripting, documentation/request management, policy and procedure management, data center considerations, and virtualization)
    - Implement standards and terminologies for maintaining privacy and security of protected health information
2. Information Literacy for Healthcare:
    - Determine the nature and extent of the privacy and security needed to protect health information
    - Propose infrastructure needed to safeguard protected health information effectively and efficiently
    - Evaluate administrative, technical and physical safeguards critically
    - Access privacy and security regulations for healthcare information transactions including policy, procedures, guidelines, security architectures, risk assessments, disaster recovery, and business continuity; particular attention given to the Health Insurance Portability and Accountability Act (HIPAA) and the Health Information Technology for Economic and Clinical Health (HITECH) Act
3. Information Management:
    - Verbalize the importance of health information exchange to healthcare outcomes
    - Have knowledge of various types of health information exchange services
    - Assure confidentiality of protected patient health information when using health information exchange
    - Assure access control in the use of health information exchange
    - Assure the security of health information exchange
    - Possess the skills as outlined in supportive functions component of the HL7 model applicable to health information exchange
    - Understand the principles upon which organizational and professional health information systems for providers and consumers are based
      Last update: 02/04/2014

Certificate of Informatics in Health Information Systems Architecture

Certificate of Informatics in Health Information Systems Architecture
Graduates of the Graduate Certificate in Informatics in Health Information Systems Architecture will be the architects and developers of advanced health IT solutions. These individuals will be cross-trained in IT and health domains, thereby possessing a high level of familiarity with health domains to complement their technical skills in computer and information science:

1. Understanding Technology and Methodologies for Processing Information Healthcare:
    - Explain health informatics and design and develop health information systems
    - Recommend usability and usefulness measures to evaluate health information systems
    - Discern principles of informatics that govern communication systems, health decisions, information retrieval, telemedicine, bioinformatics and evidence-based medicine, as well as ways in which information science and computer technology can enhance evidence-based practice in healthcare

2. Information Literacy for Health Care:
    - Inspect solutions for management and mining of data generated in scientific laboratories and clinical trials for data mining and knowledge discovery, which include knowledge discovery techniques and databases, extraction of data/ metadata stored in data warehouses using Storage Area Networks and dealing with issues of handling this data
    - Design approaches to access needed information effectively and efficiently
    - Analyze the principles and methodologies underlying most standards for healthcare data interchange and practical issues of reading and understanding specifications, implementing and translating between standards

3. Information Management:
    - Analyze theoretical and practical models for the delivery of consumer health information and implement them in the design and development of consumer health information resources

    Last updated: 02/04/2014

Certificate in Clinical Informatics

Certificate in Clinical Informatics
Graduates of the Graduate Certificate in Clinical Informatics program will be able to lead the successful deployment and use of health IT to achieve transformational improvement in the quality, safety, outcomes and, thus, the value of health services in clinical areas:

1. Understanding technology and methodologies for processing data, information and knowledge in Health Care
    - Explain concepts of information and communication technologies.
    - Integrate data from disparate systems found in hospitals and clinics.
    - Implement standards and terminologies for documenting health events and exchanging protected health information.

2. Information Literacy for Health Care
    - Determine the nature and extent of the information needed.
    - Access needed information effectively and efficiently.
    - Evaluate outcomes of the use of information in clinical practice.

3. Information Management
    - Verbalize the importance of health information systems to clinical practice.
    - Have knowledge of various types of health information systems and their clinical and administrative uses.
    - Assure confidentiality of protected patient health information when using health information systems.
    - Assure access control in the use of health information systems
    - Assure the security of health information systems

Last updated: 02/04/2014

Certificate in Informatics for Public Health Professionals

Certificate in Informatics for Public Health Professionals
Individuals graduating from this program will be able to lead the successful deployment and use of health IT to achieve transformational improvement in the quality, safety, outcomes, and thus in the value of public health services.

1. Understanding Technology and Methodologies for processing data, information and knowledge in Healthcare
    - Explain concepts of information and communication technologies.
    - Integrate data from disparate systems such as clinical data, surveillance data, etc. for public health decision making.
    - Implement standards and terminologies for documenting public health events and exchanging protected health information for improved surveillance.

2. Information Literacy for Healthcare
    - Determine the nature and extent of the information needed for public health decisions.
    - Access needed information effectively and efficiently.
    - Evaluate outcomes of the use of information in public health.

3. Information Management
    - Verbalize the importance of health information systems to public health surveillance.
    - Have knowledge of various types of health information systems and their potential use in public health surveillance.
    - Evaluate when confidentiality of protected patient health information is superseded by public health needs.

- Assure access control in the use of health information systems for public health needs.
- Assure the security of health information systems.

Last updated: 02/04/2014

Student Learning Outcomes

Student Learning Outcomes

Informatics is an applied, professional computing discipline. It responds to society's need to solve increasingly complex problems in all fields of human endeavor by acquiring, managing and interpreting data. Informatics studies the ways in which people, information and digital technologies interact.

Nearly all fields benefit from the rapidly evolving fields of computing and information science. Informatics graduates solve problems through the application of computing to their domains of expertise.

Computing and information technology are evolving rapidly. The student learning outcomes articulated here are central to educating Informatics graduates who possess both the technological and human-centered design skills necessary to develop and deploy useful digital tools that acquire and manage data for informed decision-making. They incorporate intellectual and ethical standards that every Luddy School of Informatics, Computing, and Engineering graduate should attain.

Master of Library and Information Science: graduates will demonstrate competency in connecting core values and professional ethics to practics, facilitate engagement in the information ecosystem, curate collections for designated communities, lead and manage libraries, archives and other information organizations, organize and represent information, conduct systematic research to inform decisions and innovate professional practice with information services and technology.

Master of Science

- **Applied Data Science**: graduates will demonstrate competency in data analytics, data management, infrastructure and the data science life cycle. Additionally, competency will be demonstrated in the management of massive high-throughput data stores and cloud computing and data visualization. Students will learn methods of data mining, to transform large datasets into usable knowledge, and how to represent information visually.
- **Bioinformatics:** graduates will analyze biological data and apply the analytical skills and those analyses to pioneer research and use computational tools and develop applications that bridge the gap between data and discovery.
- **Computer Science:** graduates will learn problem-solving, critical thinking, and algorithmic proficiency and software development and engineering mastery. Students will also learn systems, architecture, and hardware integration as well as data management analysis and visualization. Networking proficiency and security assurance along with ethical responsibility and effective communication will be taught and finishing with reserach mastery.
- **Health Informatics:** graduates will demonstrate competency in fundamental and profesisonal interdisciplinary skills, health and health care systems skills, technological skills and human and social context. Students will apply, analyze, evaluate biomedical information in all of these areas. Health Informatics recognizes that people are the end users of biomedical information, draws on the social and behavioral sciences to inform the design, development, and evaluation of technical solutions, policies, and economic, ethical, social, educational, and organizational systems.
- **Human-Computer Interaction:** graduates will be able to evaluate and create interfaces by applying HCI theories, terms, principles, and methods, apply psychological and cognitive principles and theories to human factors and user experience design, research and develop interactive collaborative systems by applying social computing theories and frameworks, design novel ubiquitous computing systems by researching and applying relevant HCI and informatics theories and frameworks, design effective, usable, and human-centered interactive systems using prototypes and proof of concepts,critique interaction designs on their usability, human-centeredness, and satisfaction of requirements; evaluate the fitness of requirements, goals, and research methods; make recommendations; and create and defend alternative designs, effectively communicate in digital, oral, and written form the processes, ideas, outcomes, and implications of HCI projects, articulate decisions and reasoning behind decisions made related to interaction design choices, design and research methods,exhibit sound judgment, ethical behavior, and professionalism in applying HCI concepts and value-sensitive design to serve stakeholders and society, especially in ethically challenging situations,collaborate in teams fairly, effectively, and creatively, applying group decision-making and negotiation skills.

Doctor of Philosophy

- **Bioinformatics:** graduates will be able to design computational tools and data science applications that make sense of staggering amounts of data, developing solutions that can improve health and save lives by immersing students in course projects, independent research investigations, and lab rotations that integrate informatics, technology, statistics, machine learning, computational biology, genetics, genomics, proteomics, other life science fields—and many other disciplines—in new ways.
- **Computer Science:** graduates will be able to pursue careers in research or academia or use their expertise for industry or government researchers to develope projects in artificial intelligence, machine learning, computer security and robotics. Students can be future entrepreneurs to start high tech ventures requiring advanced knowledge and expertise in computer science research.
- **Data Science:** graduates learn to define and investigate relevant research problems of data science using deep technical skills and the ability to formulate and test hypotheses using massive and heterogeneous data which provides the foundation

for graduates who can become successful researchers either in academic settings or in industrial research and development laboratories.

- **Health and Biomedical Informatics:** graduates will help to design electronic health record systems to deliver genomic and genetic information, harness the power of social media to identify, monitor, and respond to disease outbreaks and create technology to improve health care outcomes. Students will be immersed in these challenges and address them with research questions and approaches and managing and integrating systems for electronic health records and examining how we interact with technology.
- **Human-Computer Interaction:** graduates will be able to identify new problems in HCI and generate new knowledge to solve them by collaborating in research labs and be mentored by faculty with real-world expertise in UX research, social computing, accessibility, interaction design for health, android science, and other emerging HCI areas. Students will conduct HCI and usability research that spans disciplines including computing, communication, robotics/android science, biomedical devices, and human and social sciences. Students will integrate computing, usability, interface design, the social sciences and other disciplines in the design and development of user-friendly technologies, software and information systems.

Graduate Certificates

- **Archives Management:** graduates will demonstrate identifying and preserving essential parts of society's cultural heritage, organizing and maintaining the documentary record of institutions, groups, and individuals, assisting in the process of remembering the past through authentic and reliable primary sources, serving a broad range of people, who seek to locate and use valuable evidence and information.
- **Clinical Informatics:** graduates will demonstrate understanding technology and methodologies for processing information in health care, information literacy for health care, and information management.
- **Human-Computer Interaction:** graduates will demonstrate an understanding of the Internet of Things as well as HCI and UX theory with the introduction of UX design principles.
- **Health Information Management and Exchange:** graduates will demonstrate understanding technology and methodologies for processing information in health care, information literacy for health care and information management.
- **Health Information Security:** graduates will demonstrate understanding technology and methodologies for processing information in health care, information literacy for health care and information management.
- **Public Health Professionals:** graduates will demonstrate understanding technology and methodologies for processing information health care, information literacy for health care and information management.
- **School Librarianship Certificate:** core learning concept include: collaborative instruction, design, delivery, and assessment, integrated technology, student inquiry, 21^{S} Century skills and processes, collection development, library program administration, basic resources and ILS management, PK-12 youth literature, and advocacy and leadership. (for certified teachers interested in adding to their license)

Last updated: 3/2024

Master of Science in Bioinformatics

Graduates of the Bioinformatics program will demonstrate expertise in the following core competencies essential to success:

1. Extract information from different types of bioinformatics data (gene, protein, disease, etc.) including their biological characteristics and relationships.
2. Employ different data representation models and formats used for bioinformatics data representation including markup languages, such as SBML and CellML, and ontologies, such as GO ontology.
3. Apply the different approaches used for data integration and data management, including data warehouse and wrapper approaches.
4. Master computational techniques and diversified bioinformatics tools for processing data including statistical, machine learning and data mining techniques.
5. Analyze processed data in particular with the support of analytical and visualization tools.
6. Carry out bioinformatics research under advisement including systems biology, structural bioinformatics and proteomics.
7. Interact with non-bioinformatics professionals, such as biologists and biomedical researchers in order to better understand their bioinformatics needs for better support and service delivery.
8. Design and develop bioinformatics solutions by adapting existing tools, designing new ones, or a combination of both.

Last updated: 02/04/2014

Master of Science in Human-Computer Interaction

Graduates of the Human-Computer Interaction program will demonstrate expertise in the following core competencies essential to success:

1. Human-Computer Interaction Theory and Usability Terms, Principles, and Practices
    - Problem space definition and conceptual models
    - Social mechanisms used in communication
    - User-centered approaches to interaction design
    - User profiling and user needs and requirements
    - Interface design principles and processes
    - Cognitive and information processing
    - Product assessments related to a market analysis
    - Processes and life-cycles of interaction design

- Interface design and related areas of visual design and aesthetics
- Product evaluation and testing methods, both qualitative and quantitative

2. Develop and Apply Human-Computer Interation Principles and Practices Related to the Design and Evaluation of Interactive Products:
   - Produce interface designs and prototypes based on user and needs assessments.
   - Apply HCI theory, principles, and a user-centered approach to interaction design.
   - Design interactive products up to the prototype.
   - Apply evaluation and usability testing methods to interactive products to validate design decisions.

   Last updated: 02/04/2014

Master of Science in Health Informatics

Graduates of the Health Informatics program will master health informatics knowledge and skills, as well as acquire practical experience in three domains:

1. **Understanding technology and methodologies for processing data, information and knowledge in Health Care**
   - Explain concepts of information and communication technologies.
   - Elaborate basic informatics terminology like data, information, knowledge, hardware, software, networks, information systems, information systems management, databases.
   - Execute queries on large databases using data mining and testing hypothesis approaches.
   - Integrate data from disparate systems found in hospitals and clinics.
   - Implement standards and terminologies for documenting health events and exchanging protected health information.

2. **Information Literacy for Health Care**
   - Determine the nature and extent of the information needed.
   - Access needed information effectively and efficiently.
   - Evaluate information and its sources critically and incorporates selected information into his or her knowledge base and value system.
   - Either individually or as a member of a group, use information effectively to accomplish a specific health care purpose.
   - Propose/justify Decision Support Systems algorithm to support care delivery.
   - Integrate Natural Language Processing (NLP) with standards and terminologies used in healthcare.
   - Evaluate outcomes of the use of information in clinical practice.

3. **Information Management**
   - Verbalize the importance of health information systems to clinical practice.
   - Have knowledge of various types of health information systems and their clinical and administrative uses.
   - Assure confidentiality of protected patient health information when using health information systems.
   - Assure access control in the use of health information systems.
   - Assure the security of health information systems.
   - Estimate the Return of Investment (ROI) of health information technology applications for healthcare.
   - Possess the skills as outlined in direct care component of the HL7 EHRS model, which such as navigation, Decision Support, output reports and more.
   - Understand the principles upon which organizational and professional Health Information System for providers and consumers are based.

   Last updated: 02/04/2014

Master of Science in Media Arts and Science

Graduates of the Media Arts and Science graduate program will demonstrate expertise in the following core competencies essential to success as an informatics, computing and information technology professional specializing in new and interactive media:

1. Design and create digital media products that are targeted to a specific purpose and that meet professional standards for quality.
2. Plan a coordinated collection of multi-media or trans-media communications and/or experiences, using each medium to good advantage.
3. Assess media communications and/or experiences, discriminating among features that influence effectiveness.
4. Recommend strategies, practices, and/or tools appropriate to a problem.
5. Predict future trends and developments in digital media, based on examination of the history, tradition, and current drivers in the field.
6. Communicate in written and oral form to a range of audiences.

Last updated: 02/05/2014

Doctor of Philosophy in Informatics - Bioinformatics

Upon completion of the Bioinformatics PhD program, students will be able to:

1. Analyze different types of bioinformatics data (gene, protein, disease, etc.) including their biological characteristics and relationships.
2. Formulate steps involved in transforming the data to knowledge, as well as introducing different techniques used at each step
3. Impact informatics on other disciplines such as biology from several perspectives including the social and economic aspects.

4. Establish different data representation models and formats used for bioinformatics data representation including markup languages, such as SBML and CellML, and ontologies, such as GO ontology.
5. Master different approaches used for data integration and data management, including data warehouse and wrapper approaches.
6. Develop computational techniques and employ diversified bioinformatics tools for data processing including statistical, machine learning and data mining techniques.
7. Analyze processed data in particular with the support of analytical and visualization tools.
8. Perform bioinformatics research in area of interest.
9. Interact with non-bioinformatics professionals, such as biologists and biomedical researchers in order to better understand their bioinformatics needs for better support and service delivery.
10. Develop the ability to design and develop bioinformatics solutions by adapting existing tools, designing new ones, or a combination of both.

Last updated: 02/05/2014

Doctor of Philosophy in Informatics - General

Graduates of the Ph.D. in Informatics program will demonstrate expertise in the following core competencies:

1. Identify, discuss, and apply the fundamental concepts, theory and practices in informatics such as information representation and architecture, retrieval, structured query language, information extraction and integration from disparate data sources, information visualization and security, and data mining including the relevant tools and methodologies.
2. Identify and practice the knowledge of beginning statistics, including sampling and correlations, research paradigms such as constructivism and pragmatism, distinctions and limitations of qualitative, quantitative, and mixed method research designs, understanding validity and reliability.
3. Apply research proposals, conduct peer reviews, create an annotated bibliography, create and present a high-level presentation pertaining to research, and use SPSS.
4. Acquire and apply the ability to read and critique scientific articles by analyzing the problem presented, solutions proposed, and critically looking at the solutions and the results, as well as learn how organize and write a scientific article through critical thinking and discussion.
5. Write research proposals by examining NSF and NIH case studies, including style and grant specific requirements.
6. Develop and deliver class-room lectures, including processes for critically evaluating class-room lectures and how to prepare effective teaching materials.
7. Apply research methods and acquire more advanced knowledge in different areas of research through apprenticeship and mentorship.

Concentrations will have the above general outcomes plus additional ones.

Last updated: 2/05/2014

Doctor of Philosophy in Informatics - Human Computer Interaction

Graduates of the Human-Computer Interaction track will gain the additional and specific expertise described below:

1. Identify and explain HCI domain knowledge in the areas of both basic and applied research with considerable depth, including:
    - HCI theory and usability terms, principles and practices
    - Problem space definition and conceptual models
    - Social mechanisms used in communication,
    - User-centered approaches to interaction design
    - User profiling and user needs and requirements
    - Interface design principles and processes, as well as related areas of visual design and aesthetics
    - Cognitive and information processing
    - Product assessments related to a market analysis, as well as processes and life-cycles of interaction design
    - Product evaluation and testing methods, both qualitative and quantitative
2. Identify and apply HCI principles and practices during product design and evaluation (*development and usability testing*) of interactive products, including:
    - Producing interface designs and prototypes based on user and needs assessments
    - Validate design decisions through a user-centered approach to interaction design and the final analysis, evaluation and usability testing methods of interactive products
3. Identify and explain the broader HCI connections and associations among technology, theory, social analysis and application domains to arrive at a set of questions in preparation for final research and dissertation, as well as the broader significance of work within the context of past and current HCI research

Last updated: 02/05/2014

Doctor of Philosophy in Informatics - Health Informatics

Graduates of the Health Informatics track will gain the additional and specific expertise described below:

1. Become skilled in the analysis, design and implementation of information systems that support and expand the delivery of health care

2. Function as a translator between clinicians and information technology personnel
3. Ensure that information systems capture and present critical health information
4. Interact with non-health care professionals, such as computer science, information science, cognitive science and other researchers to better understand how their knowledge advances health informatics science
5. Demonstrate in-depth knowledge on health informatics research approaches
6. Propose innovative approaches to the development of health informatics knowledge

Last updated: 02/05/2014

Contact Information

Contact Information:

Luddy School of Informatics, Computing, and Engineering 535 W. Michigan Street
Indianapolis, IN 46202Phone: 317-278-4636
LuddyIN@iu.edu

Parking

Visitors can park in the IU Indianapolis Gateway Garage located across the street.

Front Desk & Student Services IT 400

Department of BioHealth Informatics IT 475G

Department of Computer Science IT 317B

Department of Human-Centered Computing IT 593

Department of Library and Information Science IT 552

Last updated: 3/2024

Tuition & Financial Aid

Tuition & Financial Aid
IU Indianapolis is an exceptional value and a world-class institution, recently ranked 8th on the list of Best Public Colleges in the Midwest by *Forbes Magazine* and the Center for College Affordability and Productivity.

And a Luddy School of Informatics, Computing, and Engineering graduate degree from Indiana University will make you even *more* valuable with its unique integration of computing, social science and information systems design that can be applied in any number of fields as an industry professional, faculty member or researcher.

The IU Indianapolis Office of the Bursar maintains current tuition and detailed fee information, including a Tuition and Fee Estimator. They also accept several methods for payment designed to make paying for college as convenient as possible.

The Office of Student Financial Services provides current information for costs of attendance for full-time, resident and non-resident graduate students.

International students' costs of attendance are slightly different and include manadatory health insurance. Please consult with the IU Indianapolis Office of International Affairs.

Financial Aid
As a master's or Ph.D. student, you have access to a wide range of financial assistance, including scholarships, grants, loans and work-study that help reduce costs. We encourage you to investigate and pursue all options for which you may be eligible.

The Luddy School of Informatics, Computing, and Engineering offers assistantships and fellowships to qualified Ph.D. and master's students. To be automatically considered for such support, you must submit the following by January 15 (Ph.D. students) or March 15 (master's and certificate students):

- A completed application with application fee;
- Your GRE score from within the past five years.

Direct financial support from the Luddy School of Informatics, Computing, and Engineering is reserved for qualified, full-time students matriculating in the fall semester. Direct financial support is rarely available for students matriculating in the spring.

To learn more about financial aid opportunities from the university or external sources, such as the federal government, please consult the IU Indianapolis Office of Financial Aid and the IU Indianapolis Graduate Office.

International Students
For information about specific financial resources for international students, please contact the IU Indianapolis Office of International Affairs.

Last updated: 02/11/2014

Graduate Programs

Graduate Programs
The Luddy School of Informatics, Computing, and Engineering offers **Master of Science** degrees in:

- Applied Data Science
- Bioinformatics
- Computer Science
- Health Informatics
- Human-Computer Interaction
- Library and Information Science

The Luddy School of Informatics, Computing, and Engineering also offers a **Doctoral (Ph.D.)** program with specializations in:

- Bioinformatics
- Computer Science
- Data Science
- Health and Biomedical Informatics
- Human-Computer Interaction

And finally, in addition to Master's and PhD degree programs, the Luddy School of Informatics, Computing, and Engineering offers a number of **Graduate Certificate** programs:

- Archives Management
- Clinical Informatics
- Health Information Management and Exchange
- Health Information Security
- Human-Computer Interaction
- Public Health Professionals
- School Library Certificate

last updated: 3/2024

Courses