



# PRAC Annual Report

Assessment of Student Learning Outcomes  
2013–2014

## Vision and Mission

The mission of the Indiana University School of Informatics and Computing (SOIC) is to excel in education, research, and civic engagement in informatics. SOIC aims to lead the nation in creating a new, broad, and interdisciplinary view of informatics and uses this viewpoint as the foundation for three foci: education and research, economic development and entrepreneurship, and diversity.

## Accreditation statement

SOIC is regionally accredited as a school of Indiana University by the North Central Association of Colleges and Schools. The Bachelor of Science in Health Information Management is also accredited by the Commission on Accreditation for Health Informatics and Information Management Education (CAHIIM). The Master of Library Science (MLS) is also accredited by the American Library Association (ALA), and is nationally recognized as one of the top ten ALA-accredited graduate programs.

## Accomplishments

Over the 2013–2014 academic year, the School of Informatics and Computing achieved various academic accomplishments, including establishing an Honors program, renaming an academic program, increasing the number of SOIC courses in the General Education Core from one to eight, increasing course evaluation response rates, reducing grade inflation, toughening the undergraduate academic probation policy, raising undergraduate minimum GPA and admissions requirements, increasing the rigor of the PhD in Informatics, Human–Computer Interaction specialization, and establishing multiple 2+2 and credit by credential agreements for transfer students.

1. SOIC established an Honors Program for undergraduate students seeking honors level courses, with the first application and acceptance process beginning fall 2014. Students have the opportunity to apply to the Honors Program upon completion of 12 IUPUI credit hours and a minimum cumulative GPA of 3.5 or higher. Up to 25 students per academic year may be accepted into the program. To graduate with honors, admitted students must complete 24 credit hours of honors courses at IUPUI, of which 15 credit hours must be within SOIC, and maintain a cumulative GPA of 3.3.<sup>1</sup>
2. The Bachelor of Science in Health Information Administration was renamed to Bachelor of Science in Health Information Management (HIM) for the following reasons: Health Information Management is the name for the major used by the American Health Information Management Association (AHIMA) and their accrediting body, the Commission on Accreditation for Health Informatics and Information Management (CAHIIM), which accredits our program. Using this name avoids unnecessary confusion among prospective students, because HIM is the industry standard for degree programs, is most likely to be searched, and emphasizes decision-making and leadership, which could assist our students with career development.

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<sup>1</sup> <https://soic.iupui.edu/undergraduate/honors-program/>

3. In addition to a previously approved Social Sciences course, INFO I202 Social Informatics, seven SOIC courses were added to the General Education Core: For Analytical Reasoning, INFO I101 Introduction to Informatics, INFO I201 Mathematical Foundations of Informatics, and INFO I210 Information Infrastructure I; for Arts and Humanities, NEWM N100 Foundations of New Media and NEWM N201 Design Issues in Digital Media; and for Social Sciences, INFO I270 Introduction to Human-Computer Interaction Principles and Practices and INFO I275 Introduction to Human-Computer Interaction Theory.
4. A policy was implemented, which raised students' response rate for course and instructor evaluations from 35% to 69%.
5. A guideline was implemented to reduce grade inflation, which has nearly eliminated egregious cases.
6. The academic requirements for the current and newly entering SOIC students were raised. The minimum grade requirement was raised from a C- to a C in all major, minor, and certificate courses along with English W131. Students earning lower than a C must meet with their academic advisor prior to the next semester's registration to discuss retaking courses.
7. The academic probation policy was also revised: A student whose semester or cumulative grade point average (GPA) falls below 2.0 will be placed on academic probation for the following semester, and a student whose semester or cumulative GPA remains below 2.0 upon completion of the probationary semester will be dismissed from the program. A student who fails to attain in the first semester a GPA of at least 1.5 will be dismissed from the program. SOIC also approved that, effective fall 2015, the direct admissions requirements will be raised to either a 3.0 GPA or a cumulative SAT score of 1000 or higher—with further increases planned for fall 2016.
8. Effective fall 2014, University College (UCol) students must earn a B- or higher in an identified course in the major they are pursuing. UCol students interested in the Media Arts and Science (MAS) program must earn a B- or higher in NEWM N100, and UCol students interested in the Informatics program must earn a B- or higher in INFO I101, before they can be admitted into their program of interest at SOIC.
9. The requirements to remain in the PhD in Informatics, Human-Computer Interaction specialization, have been increased. Students are now required to submit an annual research portfolio. The portfolio submitted upon completion of the first year must include a manuscript of publishable quality. The student must also give an oral research presentation. These requirements are in addition to those of the Qualifying Examination.<sup>2</sup>
10. The HIM program established a Credit-by-Credential agreement for Ivy Tech's Health Information Technology program's Applied Associate of Science graduates who hold the RHIT certification. This agreement allows the students to earn their BS degree in HIM from IUPUI in two years. The MAS program finalized a 2+2 agreement for Ivy Tech's Visual Communication program's Associate of Science graduates, which enables them to earn a BS degree in MAS from IUPUI in two years.
11. A five-year integrated BS in Health Science from the School of Health and Rehabilitation Sciences and an MS in Health Informatics from SOIC has been approved by the Graduate Affairs Committee.
12. The school's proposed PhD in Informatics is under consideration at the Indiana Commission of Higher Education; the proposed MS In Informatics is under consideration at the Academic Leadership Council.

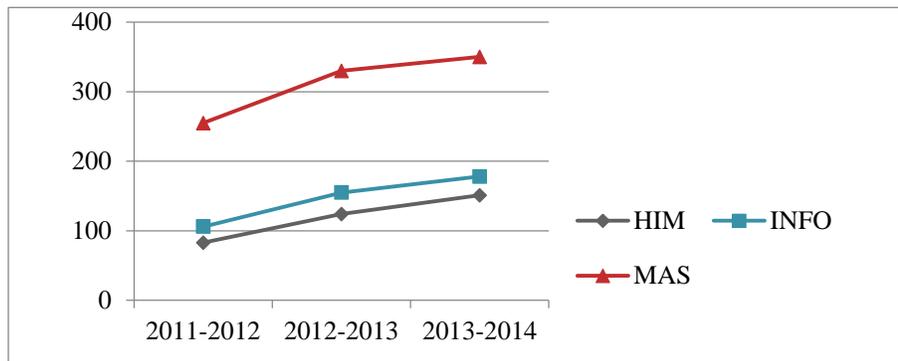
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<sup>2</sup> <http://soic.iupui.edu/files/hci-quals-review-fall2014.pdf>

## Enrollment & Graduates

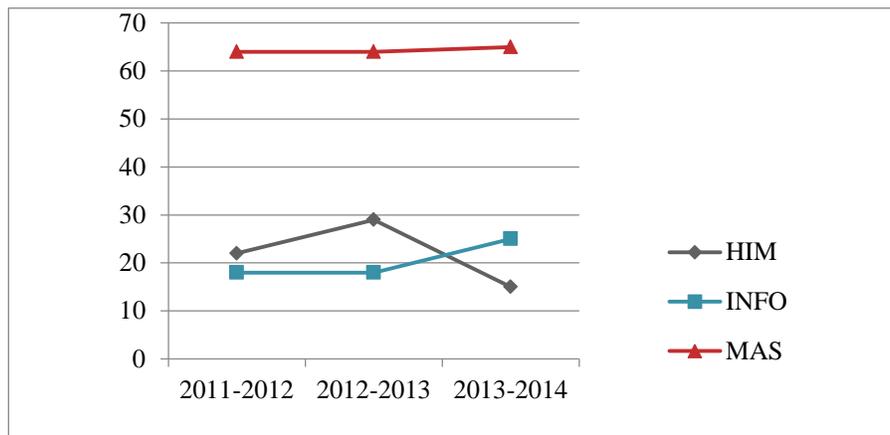
The SOIC Undergraduate programs have experienced growth over the past three academic years.

### SOIC Undergraduate Enrollment: 2011–2014



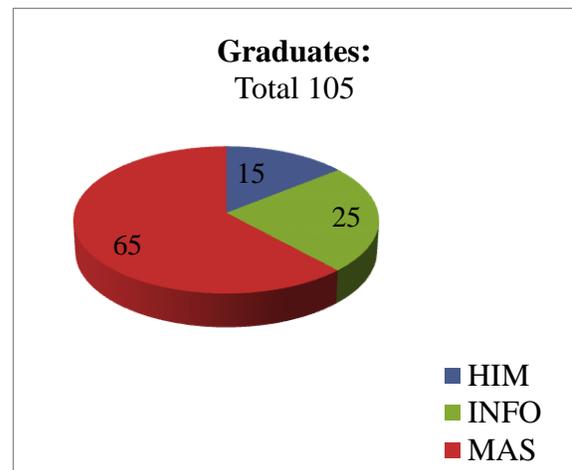
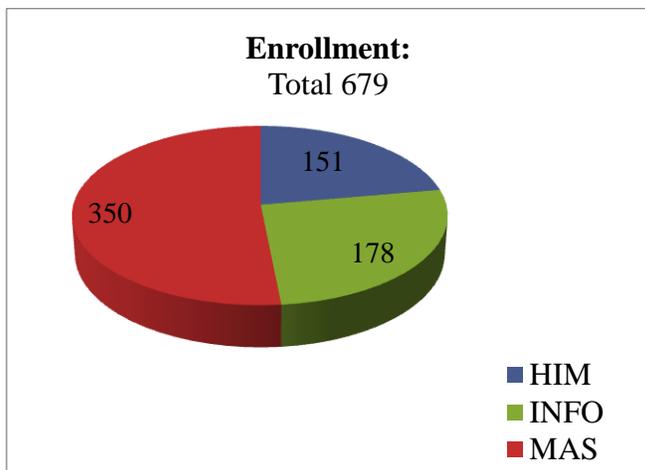
SOIC continues to graduate students from each of the undergraduate programs.

### SOIC Undergraduate Graduates: 2011–2014



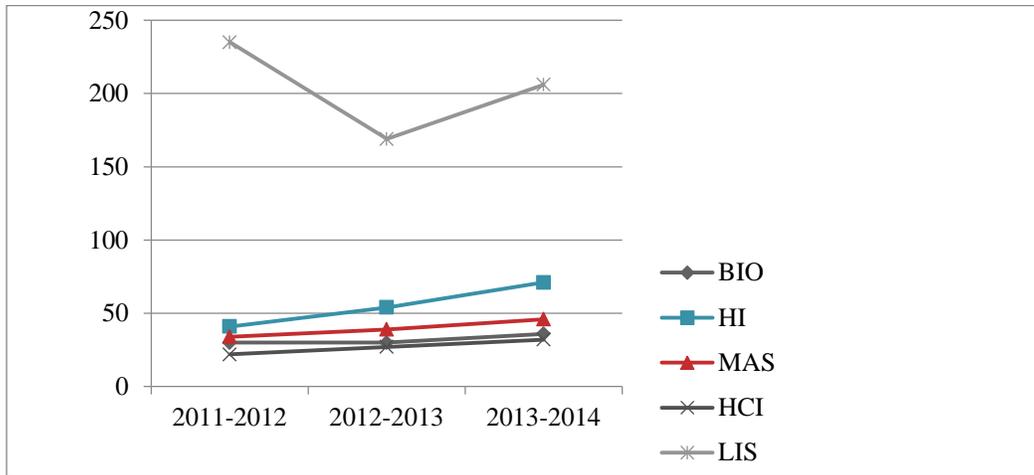
Over the 2013–2014 academic year, the undergraduate programs had a total enrollment of 679 students and a total of 105 graduates from the three undergraduate programs.

### SOIC Undergraduate Programs: 2013–2014



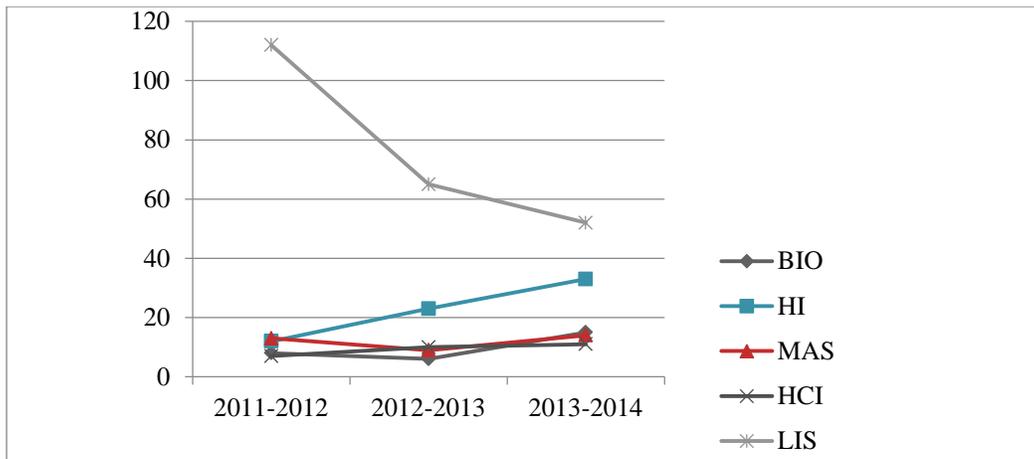
The SOIC Master programs have experienced continuous growth over the past three academic years, as shown below.

### SOIC Master Program Enrollment: 2011–2014



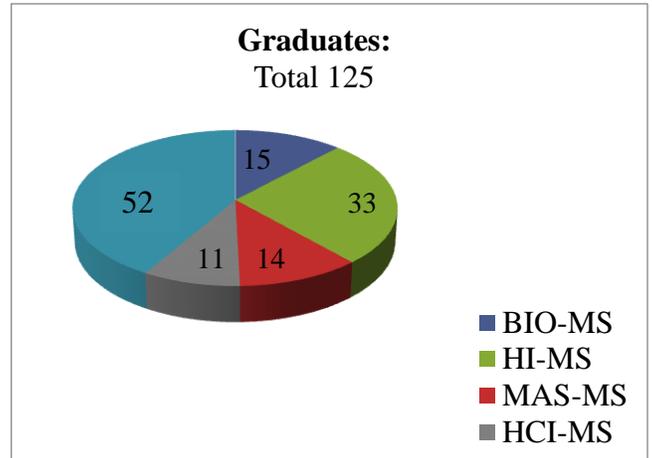
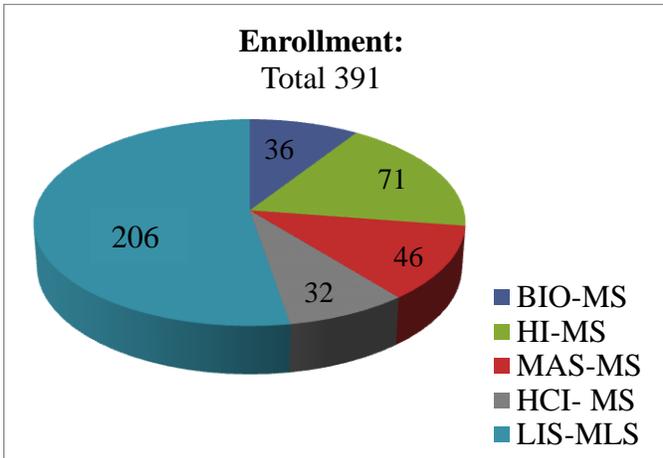
SOIC continues to graduate students from each of the Master programs.

### SOIC Master Program Graduates: 2011–2014



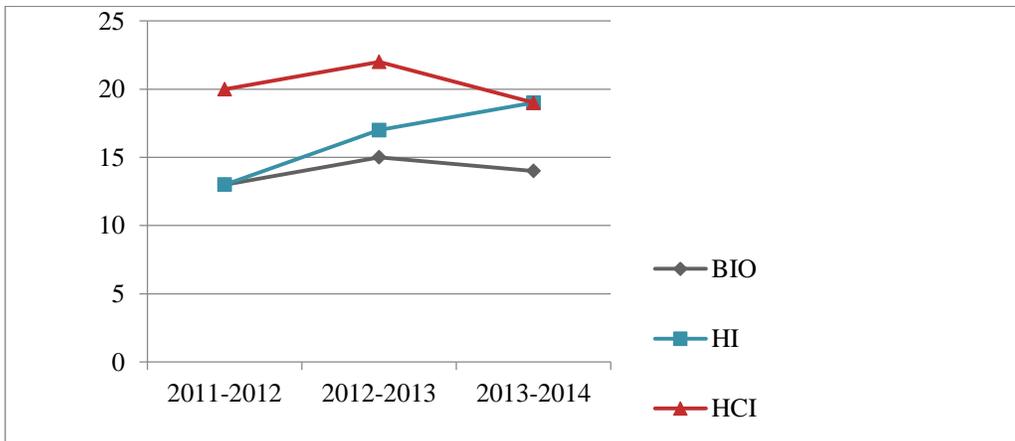
The graduate master's programs had a total enrollment of 391 students in the 2013–2014 academic year and a total of 125 graduates from the four graduate Master programs, with the breakdown shown below.

## SOIC Graduate Master Program: 2013–2014



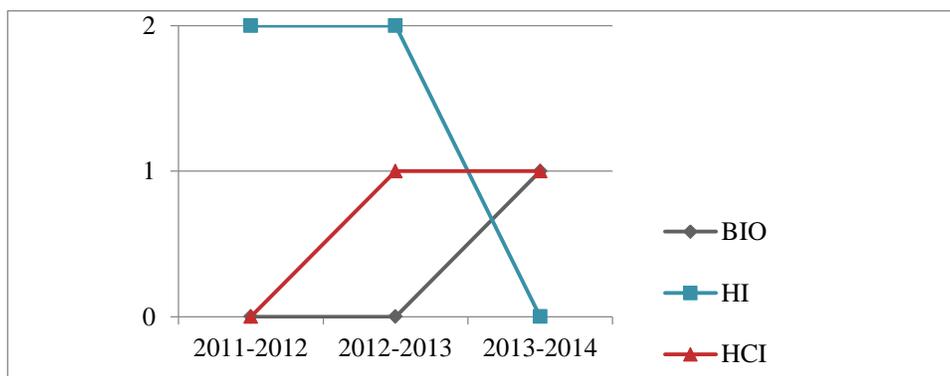
The SOIC PhD programs have maintained a steady level of enrollment over the past three academic years, as shown below.

### SOIC PhD Program Enrollment: 2011–2014



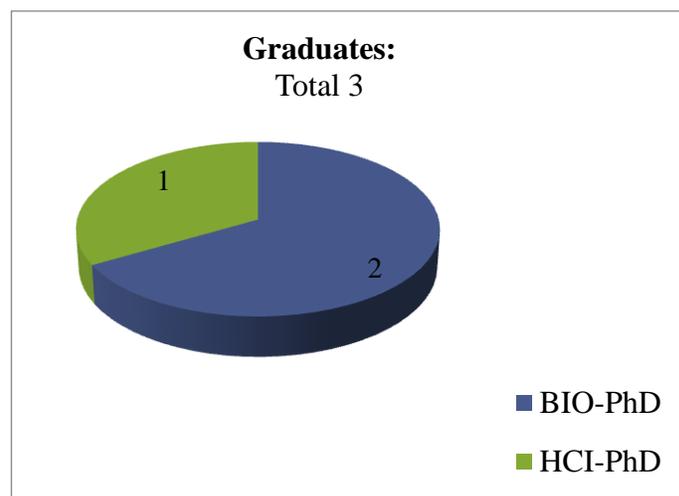
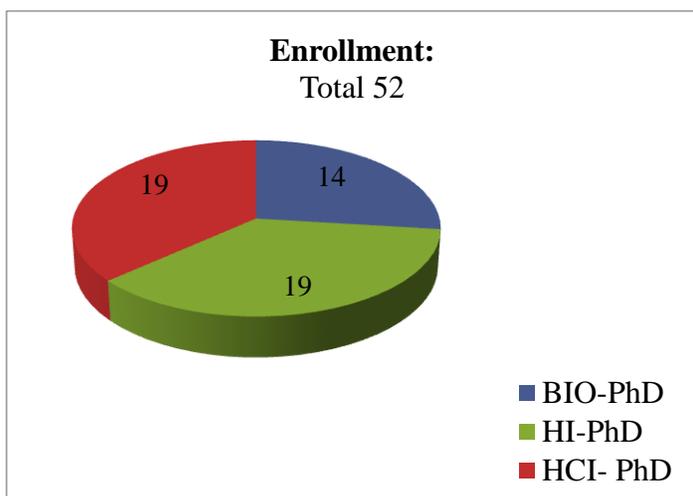
SOIC continues to consistently graduate students from each of the PhD programs, as shown below.

### SOIC PhD Program Graduates: 2011–2014



The PhD programs had a total enrollment of 52 students over the 2013–2014 academic year and a total of 3 graduates from the three graduate PhD programs, with the breakdown shown below.

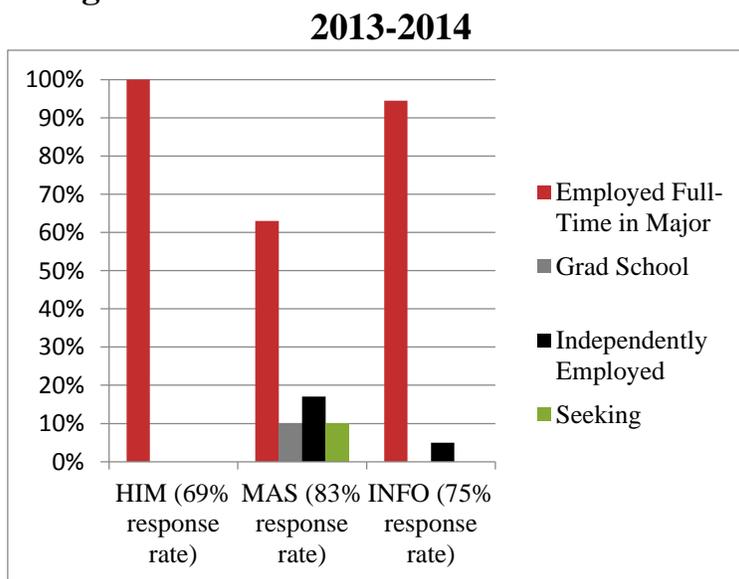
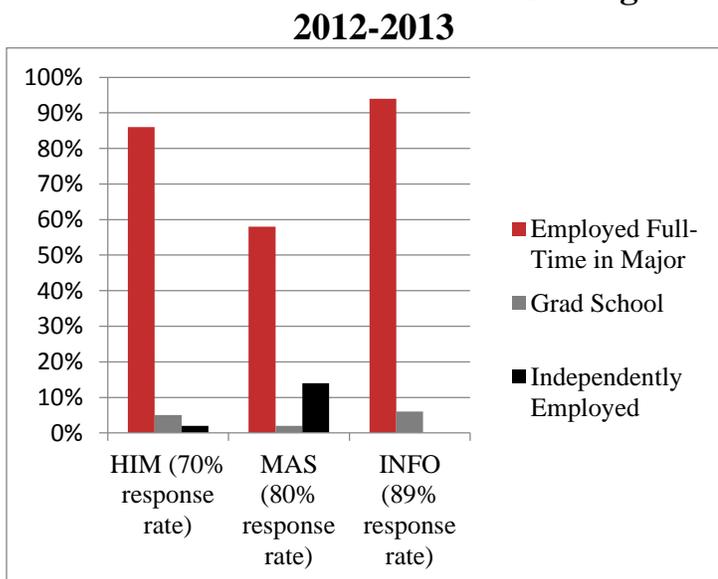
### SOIC PhD Programs: 2013–2014



### Career Services

The School of Informatics and Computing has a Career Services department, which consists of a Director of Career Services and Career Services Counselor. This department helps students with resumes, portfolios, interviews, internships, and employment, in addition to teaching multiple career-focused courses, which are required in the undergraduate programs. The following charts show the percentage of graduates who are now employed full-time in a job directly related to their major, the percentage of graduates who sought graduate school upon SOIC graduation, and the percentage of students who are independently employed.

### SOIC Career Services: Undergraduate Programs

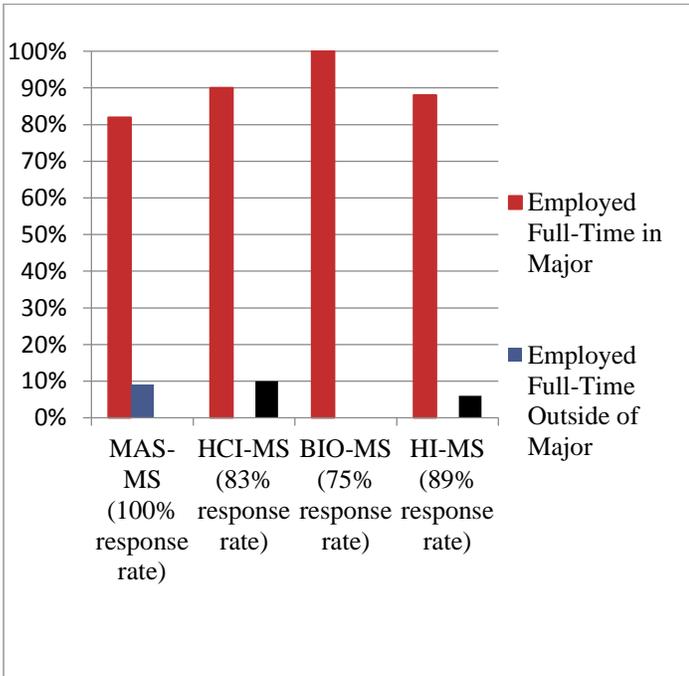


### 2013-2014

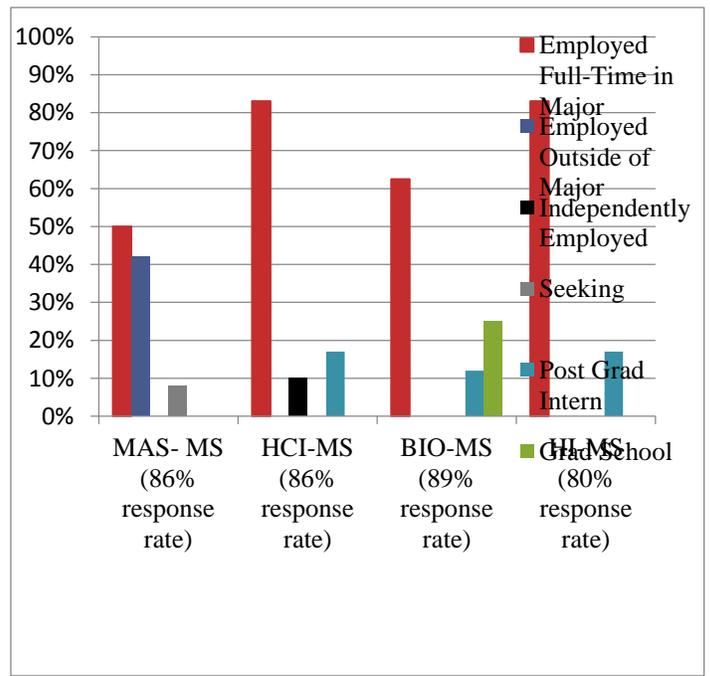


### SOIC Career Services: Graduate Programs

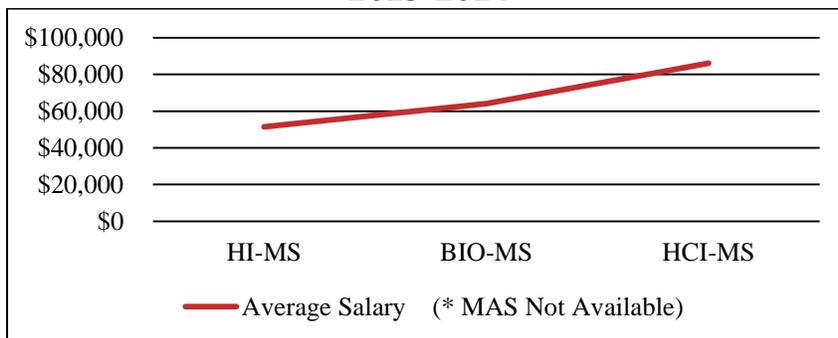
#### 2012-2013



#### 2013-2014



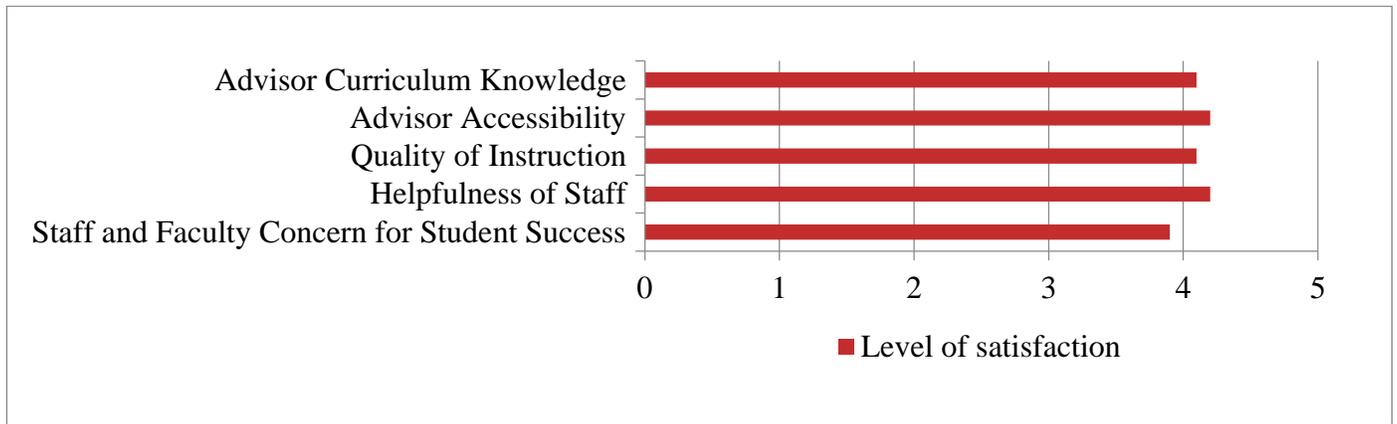
### 2013-2014



## Undergraduate Student Satisfaction Survey

SOIC implemented for the first time a student satisfaction survey, asking students to rate on a scale of 1 to 5 the level of importance and level of satisfaction on various aspects of their college experience. Some of the areas surveyed were curriculum knowledge and the availability of technology. The results allowed the school to identify the top five areas that are most important to students and evaluate the students' level of satisfaction in each of those areas. Below is a chart showing these five areas.

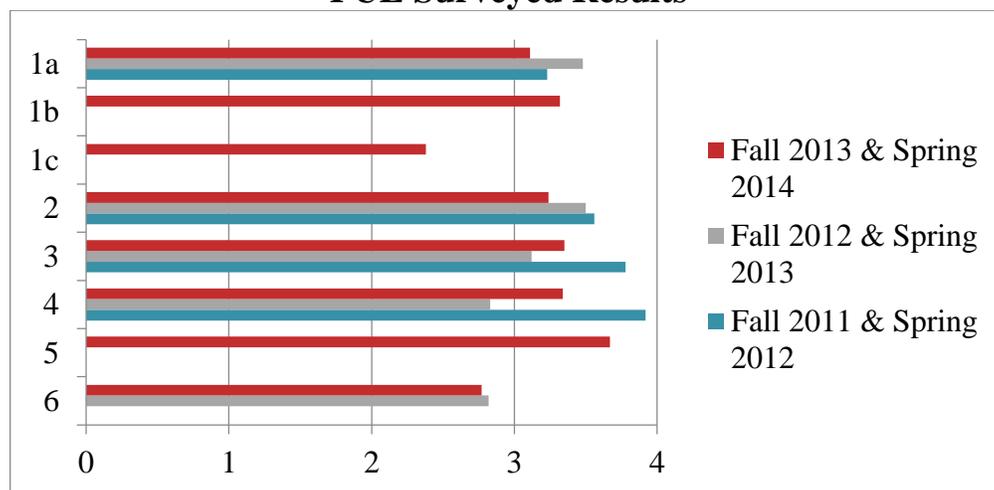
### Student Satisfaction Survey: Five Most Important Areas (in order of importance as ranked by students)



## PUL Data

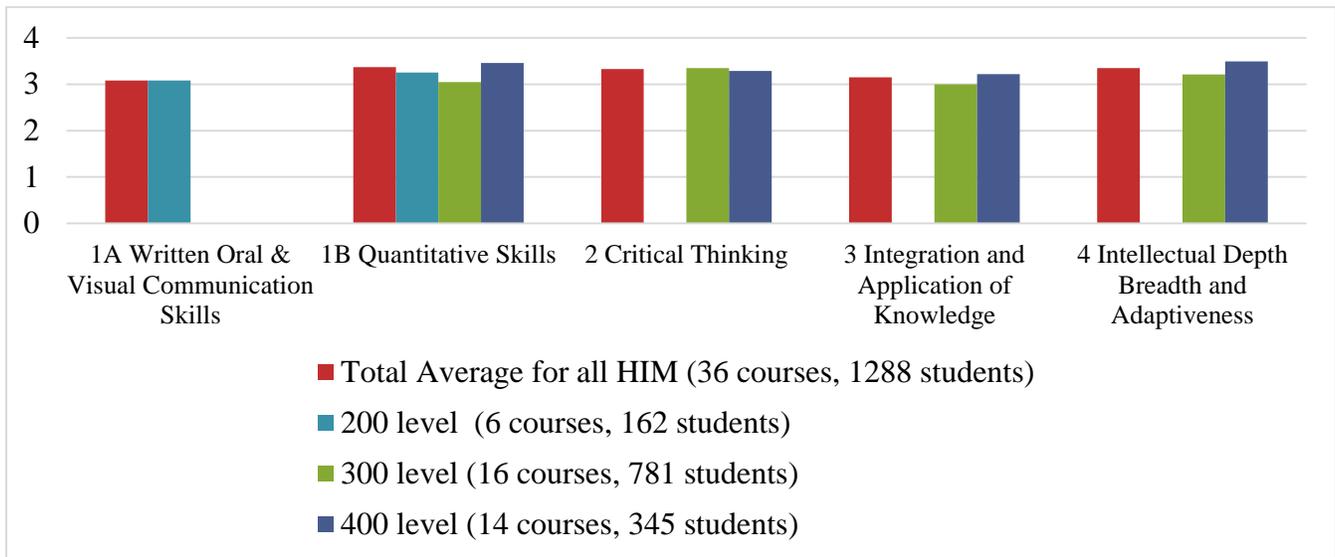
Each semester, the PULs are assessed in undergraduate courses. At the conclusion of the semester, a PUL Evaluation roster appears on the Oncourse site for each undergraduate course. Faculty members are asked to rate student performance on the PULs of Major and Moderate Emphasis in their courses. Prior to this, faculty members will have chosen an assignment or assignments that correspond to these PULs and that demonstrate student learning.

### PUL Surveyed Results

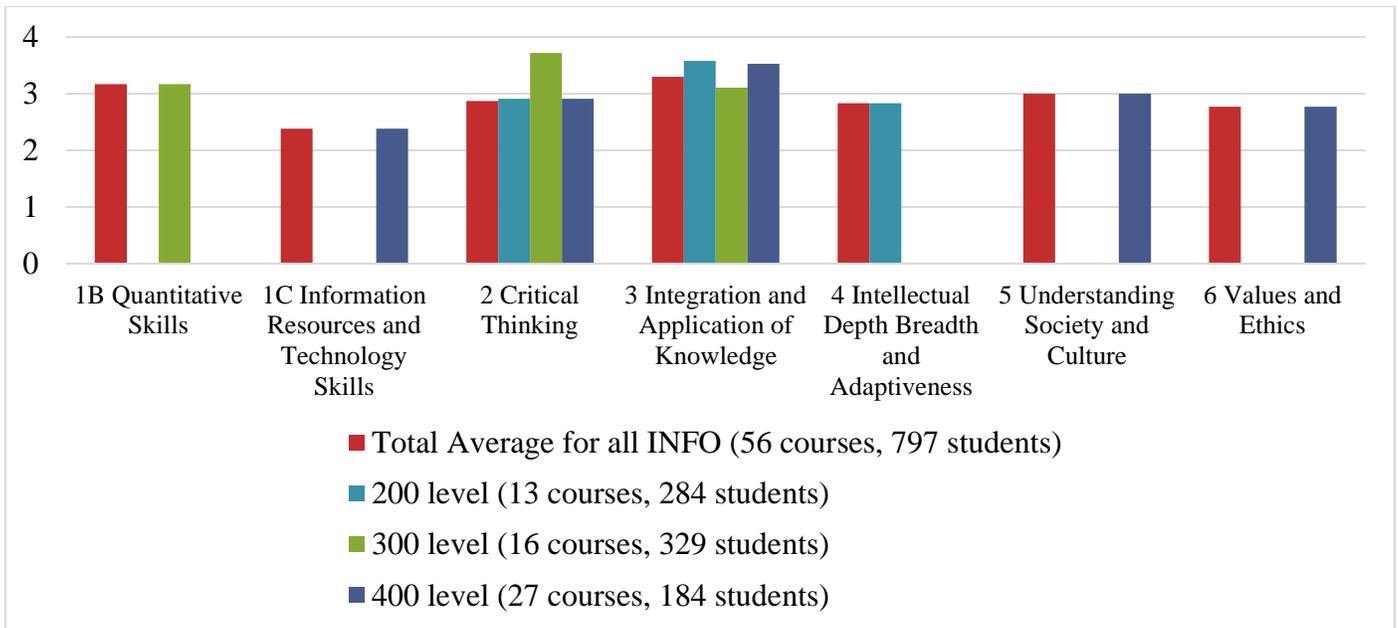


## Course-Level PUL Assessment Sorted by Program

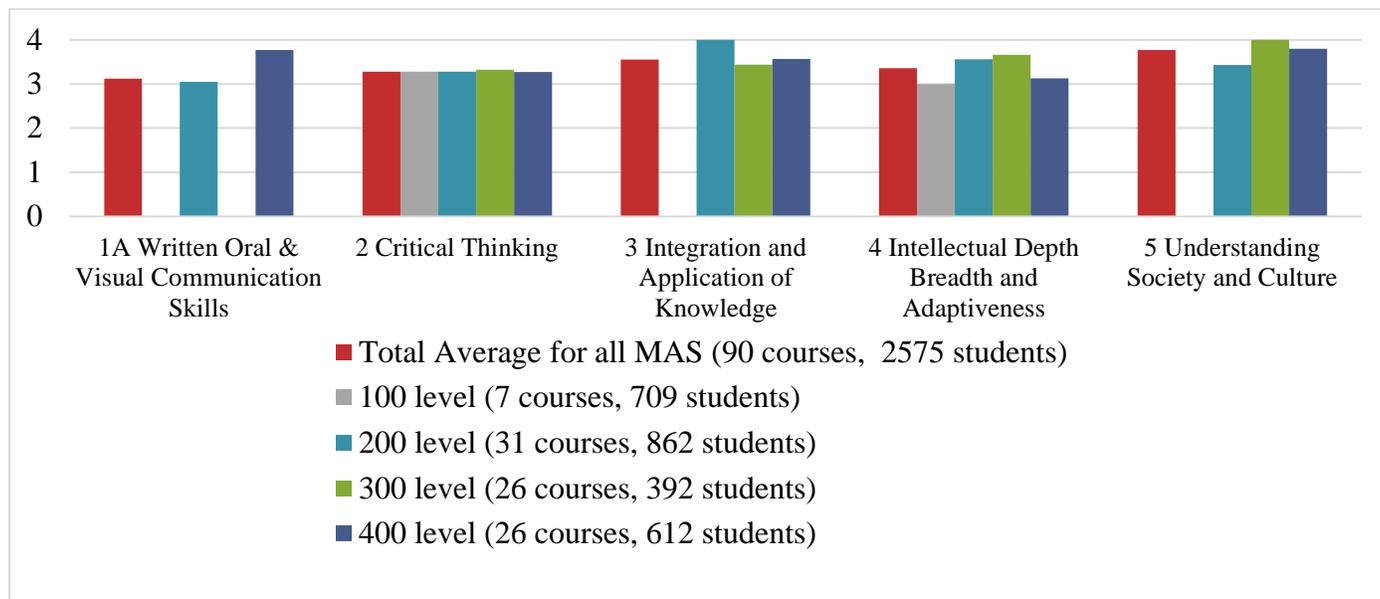
HIM, Fall 2013 and Spring 2014



INFO, Fall 2013 and Spring 2014



MAS, Fall 2013 and Spring 2014



## Undergraduate: Assessment of Program Specific Student Learning Outcomes

### BS in Health Information Management

During the 2013–2014 academic year, the Health Information Administration program presented three assessment projects:

1. Improve graduate's proficiency in the Health Information Administration (HIA) Baccalaureate Degree Entry-Level Competencies as outlined by the American Health Information Management Association;
2. Improve graduate employment performance;
3. Improve student Professional Practice Experience (PPE).

Included below are the results regarding the above assessment projects for academic year 2013–2014:

**Assessment Project 1** – Improve graduate's proficiency in Health Information Administration (HIA) Baccalaureate Degree Entry-Level Competencies as outlined by the American Health Information Management Association

#### **Student learning outcomes**

The BS in HIM has 102 student learning outcomes divided into the following six domains:

1. Data Content, Structure & Standards (Information Governance)
2. Information Protection: Access, Disclosure, Archival, Privacy & Security
3. Informatics, Analytics and Data Use
4. Revenue Management
5. Compliance
6. Leadership

The student learning outcomes are listed in the “Baccalaureate Level HIM Curriculum Map.”<sup>3</sup>

### Assessment

Students will pass the national Registered Health Information Administration (RHIA) examination with scores at or above the national average and be prepared for a full-time employment in the health information management field. The HIM program will continue to have a decreasing Drop, Fail, Withdraw (DFW) rate and an increasing retention rate, which both directly impact the number of students earning their BS in HIM degree within the state recommended timeframe of four years.

### Teaching methods

Teaching methods include lecture, laboratory, and professional practicum experience. Curriculum analysis and revision based on Commission on Accreditation of Informatics and Information Management Education (CAHIIM) accreditation standards and the Model Curriculum put in place by the American Health Information Management Association (AHIMA).

### How could you measure each of the desired behaviors listed as assessment methods?

Through ongoing analysis of the RHIA exam scores, which is sent to the Program Director on a quarterly basis, as well as through regular course content assessments performed by the HIM faculty and Professional Practicum Instructor. This annual assessment is a requirement for accreditation through CAHIIM. The practicum sites have been expanded beyond the traditional acute care hospital setting. Students are now placed in wide range of health information practicums, including software development, home healthcare, coding audit systems, physician practices, and specialty surgical facilities. This change allows the students to have greater depth in valuable real-world experience, which should translate into a wider pool of job opportunities upon graduation.

### Assessment results

For the 2013–2014 academic year, students had an 86.5% pass rate on the RHIA examination, which exceeds the national average of 76.0%.<sup>4</sup> It also constitutes a significant improvement over previous years (see below). Based on the Career Services information, 86% of the reported BS in HIM graduates are employed full-time in the HIM field.

	Degrees Awarded	Certificates Awarded	RHIA Pass Rate	National Pass Rate	CAHIIM Accreditation	Employed	Average Salary	Grad. Sch. Placement
2012–13	29	8	67.0%	76.0%	Yes	86.2%	\$39,000	0
2013–14	17	5	86.5%	76.5%	Yes	88.8%	\$42,000	1

### Changes made based on the assessment

The Program Director, Associate Dean of Academic Affairs, and Academic Advisor have worked closely with the HIM faculty and created a proposal to revise various aspects of the HIM program. Multiple courses have been renumbered, renamed, and course content revised. These improvements were made to ensure the students are learning the level of HIM material needed to pass the RHIA examination as well as obtain a full-time job in the HIM field upon graduation. Effective Fall 2014, SOIC is including a student tutor for the pre-HIA courses, to assist students currently in the program who are struggling. Classes with the highest DFW rate were identified

<sup>3</sup> [http://www.ahimafoundation.org/downloads/pdfs/2014%20Final%20Baccalaureate\\_Level\\_Curriculum\\_Map.pdf](http://www.ahimafoundation.org/downloads/pdfs/2014%20Final%20Baccalaureate_Level_Curriculum_Map.pdf)

<sup>4</sup> <http://www.ahima.org/~media/AHIMA/Files/Certification/Summary%20of%20Certification%20Activities.ashx>

(HIM M220 and HIM M330) and the instructors are now working with the Center for Teaching and Learning to make adjustments to improve student success in the classes. Course content has been expanded in HIM M490 Directed Study to include RHIA exam preparation to facilitate student success in writing the RHIA exam.

### **Assessment Project 2** – Improve graduate employment performance

#### **Student learning outcomes**

Develop a closer relationship with community partners, employers, SOIC Career Services, and HIA Connection to ensure student awareness of potential employment opportunities as quickly they are made available. Also creating solid community relationships with organizations that support education and employment for our students.

#### **Assessment methods**

Based on comments received during the HIM Advisory Council meeting, students need more proficiency in the following areas: data analysis, data presentation, and project management.

#### **Teaching methods**

1. Students have been placed in a wide range of health information practicums, including software development, home healthcare, coding audit systems, physician practices, and specialty surgical facilities. This change allows the students to have greater depth in valuable real-world experience which should translate into a wider pool of job opportunities upon graduation.
2. Beginning Spring 2015 course content will be updated to include more data analysis and data presentation. Project management could be a collaboration with Informatics for the upcoming academic year.

#### **How could you measure each of the desired behaviors listed as assessment methods?**

Program Director will stay in close contact with Advisory Board members and members of the community along with the PPE instructors regarding student knowledge in the above listed outcomes.

#### **Assessment results**

Over the 2013–2014 academic year, students had an 86.5% pass rate on the RHIA examination. Based on the Career Services information previously displayed, 86% of the reported BS in HIM graduates are employed full-time in the HIM field.

#### **Changes made based on the assessment**

The curriculum has been updated to include more emphasis on data analysis and presentation and project management may be incorporated in the upcoming academic year.

### **Assessment Project 3** – Improve student Professional Practice Experience (PPE)

The PPE courses are designed to provide professional practice experiences to the students in an approved practicum site under the direction of an HIA faculty member and an onsite professional practice instructor.

#### **Student learning outcomes**

1. Students will apply didactic knowledge in a variety of professional practice settings, which could include the following: ICD coding, quality improvement, hospital planning and

- systems, computer applications, alternate delivery systems, healthcare reimbursement, EHR implementation, and other areas as assigned at the PPE site.
2. Apply technical and management skills necessary to function in a wide variety of healthcare settings.
  3. Communicate clearly and effectively with diverse populations, including practitioners and all healthcare community stakeholders.
  4. Quantitatively analyze data that are commonly utilized by healthcare industries.

### **Assessment methods**

Student and practicum instructor evaluations and presentation of a final capstone project.

### **Teaching methods**

Practicum instructor communicates to Program Director regarding the following:

1. Student communication methods;
2. Workforce communication readiness;
3. Flexible work schedule;
4. Time management;
5. Ethical and professional skills in an immersive health information environment.

### **How could you measure each of the desired behaviors listed as assessment methods?**

Through the feedback evaluation by the practicum instructor.

### **Assessment results**

Students are now placed in a PPE site based on their post-graduation employment interest. This optimizes the learning experience for both the practicum site and the student.

### **Changes made based on the assessment**

To meet the Practicum site and student needs, accommodations are made regarding student scheduling hours to complete the assignment tasks and or projects.

### **Projects for 2014–2015**

Assessment Project 1 – Increase the RHIA exam pass rate to 90%

Assessment Project 2 – Update course curricula to meet CAHIIM requirements

Assessment Project 3 – Develop collaborative courses across departments within SOIC

## **BS in Informatics**

### **Student learning outcomes**

1. Technical Knowledge
2. Social Dynamics of Informatics and Information Technology
3. Domain-specific Critical Thinking and Problem Solving Skills
4. Collaborative Teamwork
5. Professional Ethics and Development

### **Assessment methods**

The percentage of students obtaining a full-time job in the Informatics field will increase, while the program retention rate will increase and the DFW rate will decrease. As the career statistics increase, program overall growth would be expected.

## **Teaching methods**

Analyze the current course content with the Professional Advisory Board, to ensure our Informatics students are learning the skills desired by industry professionals. This analysis is reviewed and implemented into the current curriculum, as appropriate and approved by the Informatics faculty and Program Director.

## **How could you measure each of the desired behaviors listed as assessment methods?**

Evaluating various reports showing the academic performance of the students, looking for trends on DFW rates and correlations between academic performance, graduation rate, and the likelihood of obtaining a full-time job. Re-evaluate the overall SOIC retention rate on an annual basis.

## **Assessment results**

Based on the Career Services information previously displayed, 94% of the reported BS in Informatics graduates now have a job working full-time in the Informatics field. Overall, the School of Informatics and Computing had an 88% retention rate for all undergraduates.

## **Changes made based on the assessment**

One course was highlighted as having high DFW rates (INFO I453). The instructor has discussed this course with the Department Chair, including the reasons for poor performance and the instructor is now working with the Center for Teaching and Learning to make adjustments to improve student success on the course. The course is being taught again in the fall 2014 semester, and the students will be monitored to make sure that everyone submits all assignments on time (which was the main reason for the high DFW rates in spring 2014). This course is assessed for the PULs each spring and fall semester. A smaller, more manageable class size in fall 2014 will also be helpful.

The Plan of Study is being revised for fall 2015 to provide more computer programming and database content earlier in the program, which in turn will improve performance in higher-level courses that depend on a good foundation in these topics. The required research course is being divided into two separate sections with different foci to meet student need for background in either applied or theoretical research and so that students see more of a connection between this course and their future career plans.

A Learning Environments Grant was obtained that will provide funding for a new informal learning space called I-LEARN for undergraduate Informatics students. Not only will this help to build a sense of community for this program, but it will also be a space for one-on-one tutoring, study halls, visits by the librarian and students to work together on group projects. The advisors are increasing the amount of tutoring offered to current students and will be meeting with the identified students who have earned a C- or lower in required core courses, to help with the transition of the new minimum grade requirement.

Students will not be allowed to register for courses until they have met with their Academic Advisor. This is an opportunity to crosscheck that students are not enrolled in courses beyond what they have proven to be able to handle, but also to impress upon students the new policies with respect to minimum grades, probation and dismissal.

The PULs (Principles of Undergraduate Learning) in six Informatics courses were assessed during fall 2013, spring 2014, and summer I 2014.

### **INFO I445/NEWM N485 Competitive Intelligence for Informatics I (3 credit hours) Fall 2013**

In fall 2013, INFO I445 Competitive Intelligence for Informatics I was taught. It is an online course, which is an elective in our undergraduate programs. At the end of the semester, there were eight students enrolled in the course. All assignments in the course were assigned PULs of Major, Moderate, and Some Emphasis.

The PUL of Major Emphasis in the course is PUL 1C Information Resources Skills. This PUL was assessed using the Midterm Project, which required students to begin the competitive intelligence process by conducting comprehensive research for a hypothetical company in an industry of their choice and to prepare a preliminary report with recommendations. In terms of PUL 1C, two students receiving a rating of Very Effective for their ability to demonstrate his competence in Information Resources Skills through his performance on the Midterm Project, 1 student received a rating of Effective, 3 students received a rating of Somewhat Effective and 2 students received a rating of Not Effective (1 of whom did not submit a Midterm Project). The main problem is that students do not read the instructions and thus do not respond fully or at all, to some of the questions, which results in a loss of points and low scores.

The PUL of Moderate Emphasis is PUL 3 Integration and Application of Knowledge. This PUL was assessed using the weekly Discussion Forum questions. For this PUL, three students received a rating of Very Effective for the demonstration of their learning through their participation in the Discussion Forums, three students received a rating of Effective, one student received a rating of Somewhat Effective (which typically indicates a student who participates in the Discussion Forums on an irregular basis), and one student received a rating of Not Effective (because he only participated in 1 of the 16 Discussion Forums during the semester).

### **INFO I453 Computer and Information Ethics (3 credit hours) Fall 2013**

In Fall 2013, INFO I453 Computer and Information Ethics was taught. It is an online course, which is a required core course for the Undergraduate Informatics program. At the end of the semester, there were 29 students enrolled in the course. All assignments in the course were assigned PULs of Major, Moderate, and Some Emphasis.

The PUL of Major Emphasis in the course is PUL 6: Values and Ethics. This PUL was assessed using the Self-Assessment on Professional Ethics. In this assignment, students are asked to respond to the ethical issues in a variety of vignettes provided by the ACM and then apply the ACM Canons and Disciplinary Rules. In the second step of the assignment, students compare their responses to those of a panel and discern how and why their responses are similar or different to the panel. In terms of PUL 6, 18 students received a rating a Very Effective for the demonstration of their learning through their thoughtful and thorough responses to the vignettes and questions posed in the Self-Assessment, Reflection, 4 students received a rating of Effective, 1 student received a rating of Somewhat Effective (because he provided skimpy responses in Step 1 and did not complete Step 2) and 6 students received a rating of Not Effective (because they did not submit the Self-Assessment).

The PUL of Moderate Emphasis in the course is PUL 5: Understanding Society and Culture. I assessed this PUL using the responses to the weekly Discussion Forum questions. These questions not only cover the material from that week's Module, but also ask students to self-reflect, provide their own opinions and share their expertise. Each student also goes back to the

responses for the previous Discussion Forum and provides feedback to one student, so that students not only receive my comments each week but also those of their peers. For this PUL, 22 students received a rating of Very Effective for the demonstration of their learning through their participation in the Discussion Forums, 3 students received a rating of Effective and 4 students received a rating of Somewhat Effective (which typically indicates a student who participates in the Discussion Forums on an irregular basis).

### **INFO I330 Legal and Social Informatics of Security (3 credit hours) Spring 2014**

In Spring 2014, INFO I330 Legal and Social Informatics of Security was taught. It is an online course that is not only a required course for the certificate in legal informatics, but is also an elective for the paralegal program offered through the School of Liberal Arts. At the end of the semester, there were 34 students enrolled in the course as for-credit students, with an additional 3 non-credit students through CLN. All assignments in the course were assigned PULs of Major, Moderate and Some Emphasis.

The PUL of Major Emphasis in the course is PUL 3: Integration and Application of Knowledge. This PUL was assessed using Case Study #2, which is a substantial writing assignment based on a hypothetical, but real-world scenario. For this PUL, 12 students received a rating of Very Effective for the demonstration of their learning through the comprehensiveness and quality of their submission for Case Study #2, 12 students received a rating of Effective, 4 students received a rating of Somewhat Effective and 6 students received a rating of Not Effective. The lower ratings reflect students' dislike/dread of writing as well as failure to read the instructions and respond in a comprehensive fashion to all of the elements/sub-parts of the assignment. On the other hand, the performance on Case Study #2 represented a significant improvement over Case Study #1 for most students.

The PUL of Moderate Emphasis in the course is PUL 2: Critical Thinking. This PUL was assessed using Quiz #3, a time-limited exam covering Modules 8-10 with 70 points possible. For this PUL, 23 students received a rating of Very Effective for the demonstration of their learning through their performance on Quiz #3, 7 students received a rating of Effective, 2 students received a rating of Somewhat Effective and 2 students received a rating of Not Effective (because they did not take Quiz #3).

### **INFO I453 Computer and Information Ethics (3 credit hours) Spring 2014**

In Spring 2014, INFO I453 Computer and Information Ethics was taught. It is an online course that is a required core course for the Undergraduate Informatics program. At the end of the semester, there were 37 students enrolled in the course, 2 of whom were graduate students. All assignments in the course were assigned PULs of Major, Moderate and Some Emphasis.

The PUL of Major Emphasis in the course is PUL 6: Values and Ethics. This PUL was assessed using the Self-Assessment on Professional Ethics. In this assignment, students are asked to respond to the ethical issues in a variety of vignettes provided by the ACM and then apply the ACM Canons and Disciplinary Rules. In the second step of the assignment, students compare their responses to those of a panel and discern how and why their responses are similar or different to the panel. In terms of PUL 6, 5 students received a rating a Very Effective for the demonstration of their learning through their thoughtful and thorough responses to the vignettes and questions posed in the Self-Assessment, Reflection, 18 students received a rating of

Effective, 4 students received a rating of Somewhat Effective (typically due to skimpy responses) and 10 students received a rating of Not Effective (9 students did not submit the Self-Assessment and 1 student only submitted half of the Self-Assessment).

The PUL of Moderate Emphasis in the course is PUL 5: Understanding Society and Culture. This PUL was assessed using Quiz #1, a time-limited exam which covers Modules 1-4, which includes the most significant content related to this PUL. For this PUL, 21 students received a rating of Very Effective for their demonstration of their understanding of society and culture through Quiz #1, 13 students received a rating of Effective, 1 student received a rating of Somewhat Effective and 2 students received a rating of Not Effective (because they did not take Quiz #1).

### **INFO I400/NEWM N485 Legal and Business Issues in Informatics (3 credit hours) Summer 2014**

In Summer I 2014, INFO I400/NEWM N485 Legal and Business Issues in Informatics (entrepreneurship) was taught. It is an online course that is an elective for our Undergraduate Informatics as well as other programs and is cross-listed as INFO H550 Legal and Business Issues in Informatics. At the end of the semester, there were 23 undergraduate students enrolled in the course. All assignments in the course were assigned PULs of Major, Moderate and Some Emphasis.

The PUL of Major Emphasis in the course is PUL 3: Integration and Application of Knowledge. This PUL was assessed using student performance on Quiz #1 (90 points possible), a time-limited quiz which covers Modules 1-3 in the course. For this PUL, 6 students received a rating of Very Effective for their demonstration of the integration and application of knowledge through their performance on Quiz #1, with 12 students receiving a rating of Effective, 4 students receiving a rating of Somewhat Effective and 1 student receiving a rating of Not Effective.

The PUL of Moderate Emphasis was 1A: Core Communication: Written, Oral and Visual Skills. This PUL was assessed based on a research/writing assignment that takes place at the beginning of the semester, the Preliminary Company Idea Assignment. For this PUL, 21 undergraduate students enrolled in the course received a rating of Very Effective for the demonstration of their learning through the comprehensiveness and quality of their submission for the Preliminary Company Idea Assignment. Two students received a rating of Not Effective; 1 student did not submit the assignment at all and 1 student did not follow the instructions, which cost him a considerable number of points.

### **INFO I470/NEWM N485 Litigation Support Systems and Courtroom Presentations (3 credit hours) Summer 2014**

In Summer I 2014, INFO I470/NEWM N485 Litigation Support Systems and Courtroom Presentations with my colleague, Beth Lykins, was taught. INFO I470 Litigation Support Systems and Courtroom Presentations is an online course that is a required course for the certificate in legal informatics as well as an elective for the paralegal program offered through the School of Liberal Arts. At the end of the semester, there were 17 students enrolled in the course as for-credit students with an additional 3 non-credit students through CLN. All assignments in the course were assigned PULs of Major, Moderate and Some Emphasis.

The PUL of Major Emphasis was 1C: Information Resources Skills. This PUL was assessed using the SmartDraw Midterm Mini-Project, which required students to use the SmartDraw software to provide a detailed floor plan of the room in their house/apartment/office where they study. This assignment not only evaluates students' competence in using the software, but also their ability to follow the instructions and to provide a floor plan with all of the details requested. Students also provide photographs of their rooms so that we can match what they created with reality. For this PUL, 17 students received a rating of Very Effective for the demonstration of their learning through the comprehensiveness and quality of their floor plans, 1 student received a rating of Effective and 2 students received a rating of Somewhat Effective (having failed to follow the instructions and provide all of the requested elements or because of difficulties with the software).

The PUL of Moderate Emphasis in the course is PUL 3: Integration and Application of Knowledge. This PUL was assessed using the Final Project. The Final Project required students to recreate the scene (floor and elevations) using the SmartDraw software for litigation involving a slip and fall as well as to prepare a PowerPoint presentation showing the victim's injuries, the impact on her activities (before and after), indication of her pain and suffering, a timeline and a breakdown of medical expenses and lost income. Students were also asked to prepare a paper that addressed how they would handle witness statements, expert witnesses, creating empathy for the victim, ethical issues in creating the materials and other issues related to their role in preparing materials for presentation in court. For this PUL, 13 students received a rating of Very Effective for the demonstration of the integration and application of knowledge through the Final Project, 5 students received a rating of Effective and 2 students received a rating of Somewhat Effective.

## **BS in Media Arts & Science**

### **Student learning outcomes**

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 and 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

### **Assessment methods**

The percentage of students obtaining a full-time job in the Media Arts and Science field will increase, while the program retention rate will increase and the DFW rate will decrease. As the career statistics increase, program overall growth would be expected.

## **Teaching methods**

Analyze the current course content with the Professional Advisory Board, to ensure our Media Arts and Science students are learning the skills desired by the industry professionals. This analysis is reviewed and implemented into the current curriculum when appropriate and approved by the MAS faculty and Program Chair.

## **How could you measure each of the desired behaviors listed as assessment methods?**

Evaluating various reports showing the academic performance of the students, looking for trends on DFW rates and correlations between academic performance, graduation rate, and the likelihood of obtaining a full-time job. Re-evaluate the overall SOIC retention rate on an annual basis.

## **Assessment results**

Based on the Career Services information previously displayed, 58% of the reported BS in MAS graduates now have a job working full-time in the Media Arts and Science field. Overall, the School of Informatics and Computing had an 88% retention rate for all undergraduates.

## **Changes made based on the assessment**

Classes with the highest DFW rate were identified (NEWM N215, NEWM N299, NEWM N202 and NEWM N102) and the instructors are now working with the Center for Teaching and Learning to make adjustments to improve student success in the classes. The advisors are increasing the amount of tutoring offered to current students and will be meeting with the identified students who have earned a C- or lower in required core courses, to help with the transition of the new minimum grade requirement.

# **Graduate: Assessment of Program Specific Student Learning Outcomes**

## **MS in Bioinformatics**

### **Student learning outcomes**

1. Understand technology and computational techniques for data representation, information and knowledge in bioinformatics.
2. Demonstrate mastery of the core concepts of bioinformatics, including computational biology, database design and implementation, and probability and statistics.
3. Demonstrate the capability to understand, analyze and apply bioinformatics tools and skills in a professional environment via an industrial or academic internship in bioinformatics.
4. Cultivate bioinformatics solutions and communicate scientific information in written and oral form.
5. Extract information from different types of bioinformatics data (gene, protein, disease, etc.), including their biological characteristics and relationships.
6. 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.
7. Apply the different approaches used for data integration and data management, including data warehouse and wrapper approaches.
8. Master computational techniques and diversified bioinformatics tools for processing data, including statistical, machine learning and data mining techniques.
9. Analyze processed data with the support of analytical and visualization tools.
10. Carry out bioinformatics research under advisement, including systems biology, structural

bioinformatics and proteomics.

11. Interact with non-bioinformatics professionals, such as biologists and biomedical researchers, to better understand their bioinformatics needs for improved support and service delivery.
12. Design and develop bioinformatics solutions by adapting existing tools, designing new ones or a combination of both.

### **Assessment methods**

Depending on the specific topics and expected outcomes, a selected list from the assessment methods below will be applied for the evaluation of a specific course:

1. The expected learning outcomes will be continuously assessed by assignments, quizzes, and examinations.
2. The problem solving exercises will be evaluated by the solution design, the presentation of the solution, and the performance results.
3. The laboratory sessions will be examined by the problem solving results, the software/program developed, the running results and the written reports of the laboratory work.
4. The seminars and workshops will be assessed by the student attendances, group discussions, and innovative ideas.
5. The small group projects will be assessed by the teamwork environments, the design and presentation of the project, the project performance, the oral presentation, and the written report of the project.
6. The project and thesis work will be on project performance, demonstrated programming skills, oral presentations, and the quality of written work.
7. The internship is evaluated by the employer feedback, the student performance at work, and the written report.
8. The independent study is assessed on the student's independence, initiative, and understanding while undertaking the project, a final oral presentation, and the submission of a final dissertation.

### **Teaching methods**

As Bioinformatics is a very practical subject, the teaching methods are a combination of lectures, problem solving exercises, laboratory sessions, seminars and workshops, small group projects, project or thesis, internships, and independent studies.

### **How could you measure each of the desired behaviors listed as assessment methods?**

1. The assignments, quizzes, and exams will be graded and the scores will be the measures.
2. The projects will be measured by the professors on the quality of the written reports, posters, and peer-reviewed publications.
3. The thesis will be evaluation by the thesis committee based on the quality of the thesis work, including the written report and the oral defense.
4. The practical exercises, the internship, and the lab sessions will be evaluated by the practical solutions, the skills the students demonstrated, and the student career opportunities.
5. Retention and graduation rates are also considered.

### **Assessment results**

1. First, several graduate courses have been assessed using the principles of graduate and professional learning. Appropriate revisions of content and assessments have been made to enhance student-learning experience across the curriculum.
2. Second, upon timely graduation, MS in Bioinformatics graduates find employment within their major at research centers and companies active in the field of bioinformatics, including Dow AgroSciences, Eli Lilly, Harvard Medical Schools, and others. Overall the job placement of our

graduates is high and anecdotal comments from graduates and employers on the program are favorable.

3. Third, more 80% of the MS students in bioinformatics have been involved in projects or thesis work, with one or more faculty advisors in bioinformatics. The passing rates of their oral presentation are more than 90%.
4. Fourth, more than 30% of the MS students have results in peer-reviewed conference and/or journal publications.

#### **Changes made based on the assessment**

1. Close collaboration with local industries will be enhanced for more internship opportunities. Workshop on research approaches will be improved.
2. Scientific writing and report skills will be taught in seminars.
3. Syllabi are updated each year based on faculty review and graduate student feedback.
4. Tracking of alumni will be improved.

### **MS in Health Informatics**

#### **Student learning outcomes**

1. Understand technology and methodologies for processing data, information, and knowledge in healthcare.
2. Assess and implementing information literacy for healthcare.
3. Manage effective information management.
4. Develop strategies for promoting adoption and effective use of health information technology.
5. Integrate data from disparate systems found in hospitals and clinics.
6. Implement standards and terminologies for documenting health events and exchanging protected health information.
7. Either individually or as a member of a group, use information effectively to accomplish a specific healthcare purpose.
8. Propose and justify decision support systems algorithm to support care delivery.
9. Integrate natural language processing (NLP) with standards and terminologies used in healthcare.
10. Evaluate outcomes of the use of information in clinical practice.
11. Assure confidentiality of protected patient health information and access control and the security of health information systems
12. Estimate the return of investment (ROI) of health information technology applications for healthcare.
13. Possess the skills as outlined in direct care component of the HL7 EHRS model, such as navigation decision support, and output reports.
14. Understand the principles upon which organizational and professional health information system for providers and consumers are based.
15. Mine data from electronic health record (EHR) systems using advanced statistical and data programming techniques.
16. Design data models that integrate patient data from multiple sources to create comprehensive, patient-centered views of data.

17. Design an analytic strategy to frame a potential issue and solution relevant to the health improvement of patient populations.
18. Analyze the distribution of disease and health outcomes in relevant populations of interest (e.g., general population, health system members, patient subgroups).
19. Apply clinical analytics to various contexts of quality improvement (e.g., chronic disease, patient use, population health, public health).

### **Assessment methods**

1. Assignments that require execution of queries on large databases using data mining and hypothesis-testing approaches.
2. Threaded discussions and/or written assignments evaluating health information and its sources critically and incorporating selected information into the student's knowledge base and value system.
3. Either individual or group projects demonstrating mastery in the effective use of information technology to accomplish a specific health information technology project (e.g., evaluation of electronic health records, incorporating standards in EHR systems).
4. Critical assessment of the implementation of standards and terminologies for documenting health events and exchanging protected health information in practica, projects, and/or written assignments.
5. Projects demonstrating the assurance of the confidentiality of protected patient health information when using health information systems.
6. Propose/justify decision support systems algorithms to support care delivery during class discussions, practica, and/or capstone projects.
7. Staged projects demonstrating the value of health information technology applications for healthcare.
8. Communicating effectively the importance of health information systems to clinical practice in class discussions, written assignments, and class projects.

### **Teaching methods**

The Health Informatics curriculum is focused on integrating knowledge from informatics, healthcare, health information technology and other disciplines. Courses form a cohesive and meaningful curriculum focusing on one or more of the stated student learning outcomes including real-world experience through a practicum, project, or thesis.

The program uses different teaching methods from classroom and web-based lectures with threaded discussions, experiential problem-based learning, and seminars to independent studies. The teaching method chosen is guided by the learning outcomes and the intended professional competencies of the course.

### **How could you measure each of the desired behaviors listed as assessment methods?**

Grades on formal presentations and threaded discussions are based on outcomes rubrics provided to the students at start of semester, weighed outline of written assignments, and direct assessment by faculty on pre-proposal and project proposal, and independent studies.

Each student will complete a project or thesis that will synthesize the competencies they have learned during the course of their studies. The capstone project or thesis is mentored and evaluated by a faculty committee.

### **Assessment results**

Both retention and graduation rate are high, reaching 95%, and 85% of the students enrolled in the graduate certificate program opt to pursue the master program upon graduation.

Placement in middle to high paying jobs is consistent. Several local companies such as IU Health, Community Network, and Ascension Health, add new graduates every year to their hires. Several students report promotion based on successful completion of the program.

### **Changes made based on the assessment**

Several graduate courses have been assessed using the principles of graduate and professional learning. Appropriate revision of content and assessments have been made to enhance student learning experience across the curriculum. The primary gap as reported by students is the lack of “hands-on experiences”; actions are being taken by the department to resolve this issue by providing virtual EHR laboratories. The practicum and internship offerings are also remediating the issue identified. Overall the job placement of our graduates is high and anecdotal comments from graduates and employers on the program are favorable.

Syllabi are updated each year based on faculty review and graduate student feedback. Syllabi are also reviewed to ensure the learning outcomes match the most current updates in health information technology and professional requirements.

## **MS in Human-Computer Interaction**

### **Student learning outcomes**

1. Assess user needs and requirements.
2. Design and develop user design prototypes based on user assessments, while applying HCI principles and models.
3. Apply evaluation and usability testing methods to interactive products to validate design decisions using user testing and heuristic evaluation.
4. Categorize, design, and develop information in proper architectural structures.
5. Analyze test data and write a comprehensive report on the product development process of a redesigned interface, including the stages of pre-design, design, and post-design, testing, and data analysis.
6. Apply the research methods regarding qualitative and quantitative data.
7. Implement a HCI research proposal, including research questions, collecting the relevant literature, and methodology.

### **Assessment methods**

1. Apply HCI theory, principles and a user-centered approach to interaction design
2. User-centered approaches to interaction design
3. Problem space definition and conceptual models
4. Product assessments related to a market analysis
5. Interface design and related areas of visual design, aesthetics, principles and processes
6. Product evaluation and testing methods, both qualitative and quantitative
7. Analyze processed data with the support of analytical and visualization tools
8. Produce interface designs and prototypes based on user and needs assessments
9. Design interactive products up to the prototype stage
10. Apply evaluation and usability testing methods to interactive products to validate design decisions

### **Teaching methods**

The Human-Computer Interaction curriculum is focused on integrating computing, usability, interface design, the social sciences and other disciplines in the design and development of user-friendly technologies, software and information systems. Courses focus on the student learning

outcomes including real world experience through an applied research project or thesis. The current course content is analyzed among faculty and with the HCC Department Advisory Board, to ensure our HCI students are learning the skills desired by the industry professionals. This analysis is reviewed and implemented into the current curriculum when appropriate and approved by the HCI faculty and the Department Chair.

### **How could you measure each of the desired behaviors listed as assessment methods?**

Students will complete an applied research project or thesis that will synthesize their competencies they have learned during the course of their studies which is mentored and evaluated by a faculty advisor.

### **Assessment results**

Both retention and timely graduation rates within the program are high (very close to 100%). Upon graduate, MS in HCI students find high-paying jobs within their major at top companies active in the field of HCI, including Yahoo!, Yahoo! Research, ExactTarget, IU Health, and Angie's List, with starting salaries ranging between \$62,000 and \$105,000 (excluding signing bonus and relocation expenses).

### **Changes made based on the assessment**

Syllabi are updated each year based on faculty review and graduate student feedback. Syllabi are also reviewed to ensure the learning outcomes match the most current updates in user experience and interface design.

## **Master in Library Science (MLS)**

### **Student learning outcomes**

1. Approach professional issues with understanding
2. Assist and educate users
3. Develop and manage collections of information resources
4. Represent and organize information resources
5. Manage and lead libraries and other information organizations
6. Use research effectively
7. Deploy information technologies in effective and innovative ways

### **Assessment methods**

LIS students all complete an electronic portfolio of artifacts, which demonstrate their mastery of the course outcomes. These are self-selected by the students, who also reflect on how the entire program (not individual courses) has achieved for them the outcomes. Faculty then review a random sample by program area.

### **Teaching methods**

The Master of Library Science program courses focus on specific student learning outcomes listed above culminating with an electronic portfolio. The program is accountable for planning and assessment to their professional accreditors (American Library Association, Committee on Accreditation), which assist in shaping coursework as well.

### **How could you measure each of the desired behaviors listed as assessment methods?**

Current assessment requires all students to complete an electronic portfolio within which there is a cell representing each program outcome. Students deposit artifacts within the cells, and

complete a brief reflection on how the artifacts address the outcomes. Student portfolios are reviewed by all full-time faculty on a numeric scale along with qualitative notes.

### **Assessment results**

For the 2013–2014 academic year, while data was collected, it will not be reviewed until mid-November. The Department experienced a sudden medical leave among its faculty and has not had time to devote to this.

### **Changes made based on the assessment**

Syllabi are updated each year based on faculty review and graduate student feedback. Syllabi are also reviewed to ensure the learning outcomes match the most current updates in the field of library science and accreditation standards.

## **MS in Media Arts & Science**

### **Student learning outcomes**

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

### **Assessment methods**

#### **Teaching methods**

The Media Arts and Science curriculum emphasizes an applied, project-based approach to the latest in digital media production. Courses are highly customizable based on student areas of interest and skill. Courses focus on the student learning outcomes including real-world experience culminating with a capstone project or thesis.

#### **How could you measure each of the desired behaviors listed as assessment methods?**

Students complete a capstone or thesis that synthesizes the competencies they have learned during the course of their studies, which is mentored and evaluated by a faculty advisor. Students will create digital media projects to enhance their professional portfolios.

### **Assessment results**

Upon timely graduation, MS in MAS graduates find employment within their major at companies active in the field of interactive media, including Good, ExactTarget, Koeus Solutions, Evanced Solutions.

### **Changes made based on the assessment**

Syllabi are updated each year based on faculty review and graduate student feedback. Syllabi are also reviewed to ensure the learning outcomes match the most current updates in digital media production.

## **PhD in Informatics**

The School of Informatics and Computing has three specializations within the PhD in Informatics: Bioinformatics, Health Informatics, and Human-Computer Interaction.

### **Student learning outcomes**

1. Identify, discuss and apply the fundamental concepts, theories 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 tools and methodologies
2. Apply knowledge of beginning statistics, including sampling and correlations, research paradigms, distinctions and limitations of qualitative, quantitative and mixed method research designs, 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/results, as well as learn how to 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 classroom lectures, including processes for critically evaluating classroom lectures and how to prepare effective teaching materials
7. Apply research methods and acquire advanced knowledge in different areas of research through apprenticeship and mentorship

### **Assessment methods**

#### **Bioinformatics**

1. Write research proposals by examining NSF and NIH case studies, including style and grant-specific requirements
2. Develop and deliver classroom lectures, including processes for critically evaluating classroom lectures and how to prepare effective teaching materials
3. Apply research methods and acquire advanced knowledge in different areas of research through apprenticeship and mentorship
4. Performance on course work, such as grades for assignments, quizzes, and exams
5. Performance on the Qualifying Examination
6. Performance on the Dissertation Proposal
7. Performance on the Dissertation Defense
8. Performance on peer review publications
9. Performance on educational activities
10. Performance on research oriented apprenticeship and mentorship

Courses and the Qualifying Examination are used to ensure that the student has the breadth of knowledge needed for research success. The Dissertation Proposal is used to ensure that the scope of dissertation research is important, that the plan is well thought out and that the student has sufficient skills and thoughtfulness needed for success. The Dissertation Defense is used to assess the outcomes of the dissertation research, and whether or not the plan agreed upon by the Dissertation Committee has been appropriately followed.

### **Health Informatics**

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 and applications

### **Human-Computer Interaction**

1. Identify and explain HCI domain knowledge in the areas of both basic and applied research with considerable depth, including: HCI Theory and usability term, 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 assessment related to market analysis; product evaluation and testing methods
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 and 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

### **Teaching methods (How will you help students learn it?)**

All specializations include core courses, research rotations, choice of minor, qualifying examinations and a dissertation.

### **How could you measure each of the desired behaviors listed as assessment methods?**

All PhD candidates must complete a dissertation of original research and ending with a defense of their dissertation in an open seminar. Each student has a committee of faculty members to mentor and assist in their research throughout the program in accordance to the IUPUI Graduate School Bulletin.

### **Assessment results**

The Health Informatics program had an 80% passing rate on the qualifying exams.

The Bioinformatics program had a 75% passing rate on the qualifying exams. The passing rate for thesis proposal and thesis defense are 100%. The peer reviewed publications are averaged to be more than one publications per year per student.

### **Changes made based on the assessment**

- Workshop for future researchers in Bioinformatics

- Workshops for future professors in Bioinformatics

Course syllabi are updated each year based on faculty review, PhD candidate feedback, and updates in the field of Informatics.