

**School of Informatics
Undergraduate Education Strategic Plan**

Final Report

The following report represents the Final recommendations of the committee's investigation of strategic priorities for undergraduate education.

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Meeting Schedule: September 11, 2007 - completed
September 18, 2007 - completed
October 2, 2007 - completed
October 16, 2007 - completed
October 30, 2007- completed
November 13, 2007 - completed

Vision

The undergraduate degree programs, course offerings, and services of the Indiana University School of Informatics will be guided by a student-centered philosophy. Our objective is to provide compelling educational programs for our students that provide the intellectual foundation upon which each student can build a career and compete in the job market.

Key Drivers for Change

1. The ubiquitous and central role of information technology in society, science, and business.
2. The increased influence of new media concepts, technologies, and approaches for commerce, entertainment, science, including life sciences, and law.
3. The pace of change in technology.
4. The fluid nature of the information technology workplace with respect to internationalization and globalization.
5. The increased demand for graduates that possess technical, teamwork, analytical problem solving, and communication skills – the combination of which is an absolute necessity for career success in the 21st century.
6. The decline in the number of students enrolling in non-major offerings, which creates a need for a strong set of undergraduate programs to articulate with and add value to other academic programs.
7. The decline in the number of students studying traditional computer science.
8. The increased computer competency levels for incoming students.
9. The impending changes to general education at Indiana University.

Aspirations for Undergraduate Education

1. Maximize **student success**, as measured by learning outcomes according to clearly stated goals.
2. Graduate **highly-skilled** and **high quality** students, from the viewpoint of students, faculty, alumni, and industry.
3. Develop improved **curricular value**, from the perspective of prospective and current students, major and non-major students, tenure-track and teaching faculty, as well as industry partners.
4. Increase **coherence, flexibility, and integration** of curricular offerings across campuses and degree programs.
5. Improve **student access** to academic programs through enhanced scholarship programs, outreach, recruitment, and retention activities.
6. Enhance and sustain **faculty engagement** in undergraduate education.

Critical Success Factors

The following items represent actions that are **necessary** for the undergraduate programs to be healthy, and enable the strategic priorities to be attainable. The order of the factors represents the committee's assessment of the importance of the factors.

- 1) Devise an updated curriculum for Computer Science.
 - a. Redesign around a smaller core, funneling students into a variety of concentration areas (see strategic goal #1)
 - b. Emphasize and value teamwork and project-based learning experiences.
 - c. Enhance recruitment and retention.
- 2) Improving undergraduate education in the SOI is contingent upon broad participation of faculty and improving the quality of teaching.
 - a. Increase buy-in from the faculty as to the importance of the undergraduate program and participating widely in curriculum development.
 - b. Implement a merit review and reward system that clearly describes linkages between attaining desired learning outcomes and teaching performance. Establish appropriate incentives for quality teaching and curriculum development and disincentives for substandard teaching.
 - c. Create a reflective teaching environment and provide assistance for improving teaching.
 - d. Identify advising and mentoring of undergraduates as part of the teaching mission
- 3) Measurements of student learning outcomes and teaching effectiveness in support of the learning outcomes.
 - a. Identify outcomes for each class, including learning objectives, attrition and retention expectations.
 - b. Establish measures of teaching effectiveness and revisit measures on an ongoing basis.
 - c. Leverage existing campus resources (CIC, FACET, BEST).
- 4) Align education with current industry expectations.
 - a. Early project-based experiences.
 - b. Enhance student knowledge and ability through methods that incorporate the non-technical skills: Problem solving, teamwork, oral and written communication, and presentation skills.
- 5) Develop enhanced student support structures.
 - a. Undergraduate mentoring, advising, encouragement and recognition.
 - b. Faculty involvement in advising.

- 6) Determine the sensitivity of the total number of credit hour and course requirements with respect to recruitment, retention, and educational goals.
- 7) Develop a clearly stated definition of the Informatics BS degree.
 - a. Deliver message in different formats.
 - b. Establish brand around key words and concepts.

Strategies to Achieve the Aspirations

The order of the strategies represents the committee's assessment of the importance of the item. Item 4 is seen by the committee as a medium term opportunity to bridge activities across the campuses. Item 5 is most important for IUPUI programs in the near term. Because of the ongoing process to revisit the HCI and New Media Curricula at IUPUI, the committee did not include actions specific to those areas.

- 1) Develop a new model of the undergraduate core for Informatics and Computer Science.
 - a. Common entry point for entire school, to provide for sorting (instead of filtering), and increase the number of opportunities to align student interests with majors and minors. Within the first 1.5 years:
 - i. A new breadth course.
 - ii. A new programming course to empower students to solve problems.
 - iii. A new Math / Combinatorics / Logic course.
 - iv. Other areas still open for discussion.
 - b. Additional project courses within the first 3 years.
 - c. Create a view of the breadth of opportunities at the entry point
 - i. Provide freedom and be more competitive with other programs.
 - ii. Flexibility for deferring decision on major.
 - iii. Respond to rapid changes in technology.
- 2) Develop new tracks within and across our existing programs to provide flexible and valuable opportunities for majors and non-majors.
 - a. Leverage offerings in each program to create tracks that ignore program boundaries. For example, partner with New Media in Indianapolis to broaden opportunities in Bloomington and Indianapolis.
 - b. Develop partnerships with programs outside the SOI to create new opportunities for students to add one of our tracks to their course of study.
- 3) Develop new course offerings for non-major students.
 - a. The non-major curriculum should be evaluated and redesigned to ensure that it provides clear value in supporting the educational objectives of Indiana University undergraduates and the curricula of academic departments.

- b. The non-major curriculum should be designed to funnel students into follow-on course opportunities, which may lead to majors and minors within the school.
 - c. Consider ways in which non-major curriculum can be expanded beyond providing technical skills.
- 4) Co-develop new courses and programs that combine the unique strengths of the Indianapolis and Bloomington faculty. Consider developing certificate programs in, for example, New Media, Web Design and/or Video Game Programming that meet employer needs and student objectives. Such programs typically require 24-28 credit hours and are able to stand alone or be part of another curriculum, but are not automatically earned by completing the requirements for a major.
- 5) Investigate opportunities afforded through distance education technologies. Recognize different opportunities across and between campuses, as well as opportunities to address needs of students that cannot attend classes on campus.

**IU School of Informatics
Strategic Planning-Undergraduate Education Committee
Summary of September 11 Meeting SWOT Analysis**

Overview. This is a summary of the Undergraduate Education Committee’s SWOT analysis that reflects input from Bloomington Informatics, IUPU-I Informatics, Bloomington Computer Science, and the IUPU-I Health Information Administration program. Where I’ve listed question marks, the remark came from one of the departments, but seems it might apply to those with question marks.

Identified Strengths	Info-B	Info-IUPU-I	CS-B	HIA-IUPU-I
Flexibility of degree	X	X		
Unique, new, interesting	X	X		
Meets gen. ed. requirements; gen ed progression	X	X	X	
Variety of cognates	X	X		
Good student advising		X	X	X
High demand for graduates	X	X	X	X
Blends content with technology	X	X		
Blends theory with application	X	X	X	X
Good external reputation	X	X	X	X
Available online				X
Record enrollments				X
Scholarship opportunities	X (?)	X (?)	X (?)	X
Strong alumni support	X	X	X	X
Mandatory internships				X
Defined skill set for profession				X
Only HIA program housed in Informatics				X
Collaboration with other units	X	X		

Identified Weaknesses	Info-B	Info-IUPU-I	CS-B	HIA-IUPU-I
Defining market & Informatics	X	X		
Admission standards; perceived quality of students	X	X		
Low enrollments	X	X	X	
Unclear skill sets of students	X	X		
Decreasing faculty interest	X		X	
Dated curriculum			X	
Non-major curriculum under-staffed, under-supervised			X	
Lack of reward system to recognize quality teaching	X	X	X	
Too many cognates	X (?)	X		
Lack of research focus				X
Cost of out-of-state tuition for distance students				X
Competition from other online programs				X

Identified Opportunities	Info-B	Info-IUPU-I	CS-B	HIA-IUPU-I
As Informatics grows, need for more courses		X		
More online and distributed courses	X (?)	X	X(?)	
More undergraduate certificates	X	X		
More internships, outreach, career services, mentoring	X	X	X (?)	
Partnering with Kelley for entrepreneurship	X	X	X (?)	
Make I101 exciting gateway to degree	X	X		
Large service courses to generate revenue	X	X	X	
More out-of-state, international recruitment	X (?)	X	X (?)	X (?)
Team taught courses		X		
Use of cutting edge technology	X	X		
Commitment of faculty teaching in undergrad program	X	X	X	
Develop bioinformatics degree		X		
Community outreach projects		X		
Need for programming skills in other disciplines		X		
Untapped market; large student body relative to our size	X (?)	X (?)	X	
Collaboration with other health professions				X
Health cognate in informatics				X
Growth in associate HIT programs has potential for more degree students				X

Identified Threats	Info-B	Info-IUPU-I	CS-B	HIA-IUPU-I
Lack of clear mission	X (?)	X(?)	X	
Other campus programs see us as a threat	X (?)	X		
Is it computer science lite?	X	X		
Data to answer question: what can I do with an Informatics degree	X (?)	X		
Tie to graduate programs in bioinformatics, health informatics, etc.	X (?)	X		
No body of true undergraduate faculty		X		
As a system-wide degree, can we make changes fast enough?	X(?)	X		
Upside-down ratio of credit hours students take vs. other schools	X (?)	X		
Appropriations high/tuition low. Perception that we are over-funded	X(?)	X	X (?)	
Funding for future faculty		X	X	
Infrastructure support		X		
Space issues	X	X	X	X
Technology investments	X	X		
Over-emphasis on informatics being about data		X		
Other online programs				X
Competition from other programs may make it difficult to find professional practice sites				X

Remaining current with and ahead of market	X	X		
Unclear measures of teaching quality	X	X (?)	X(?)	
Inconsistent connection of skills in course sequences	X	X (?)		
Cognate/specialty confusion	X	X (?)		
Number and quality of AI's	X			
Advising quality and structure	X			