

## Full Program Proposal

### A.S. in Computer Science

To be offered by

Ivy Tech Community College at Eight Campuses and  
Statewide via Distance Education Technology

#### 1. Characteristics of the Program

**a. Campus(es) Offering Program**

New program to Ivy Tech Community College

**b. Scope of Delivery (Specific Sites or Statewide)**

Statewide Distance Education (All Regions – All Campuses)

Region 1 – Northwest (Valparaiso campus)

Region 2 – North Central (South Bend campus)

Region 3 – Northeast (Fort Wayne campus)

Region 4 – Lafayette (Lafayette campus)

Region 7 – Wabash Valley (Terre Haute campus)

Region 10 – Columbus (Columbus campus)

Region 12 – Southwest (Evansville campus)

Region 14 – Bloomington (Bloomington campus)

**c. Mode of Delivery (Classroom, Blended, or Online)** – all three modes will be utilized

**d. Other Delivery Aspects (Co-ops, Internships, Clinicals, Practical, etc.)**

**e. Academic Unit Offering Program:** School of Applied Science and Engineering  
Technology

The suggested CIP Code for the new program is 11.0701 , defined as follows:

A general program that focuses on computers, computing problems and solutions, and the design of computer systems and user interfaces from a scientific perspective. The program includes instruction in the principles of computational science, and computing theory; computer hardware design; computer development and programming; and applications to a variety of end-use situations (NCES, *Classification of Instructional Programs*. 2000 edition).

#### 2. Rationale for Program

**a. Institutional Rationale (e.g. Alignment with Institutional Mission and Strengths)**

The implementation of this program further strengthens the college's science, technology, engineering, and mathematics (STEM) curricula. The Computer Science Associate Degree program will prepare students to work in fields that span computational theory through cutting-edge development of computing solutions. Computer Science provides a foundation that permits its graduates to adapt new technologies through three principal categories that include (a) designing and building software; (b) developing effective ways to solve unique problems in the computer sciences; and (c) devising new and better ways of using computers to address real-world challenges confronting our citizens. Graduates of the program will gain a foundation and proficiency on processes that handle and manipulate large amounts of information that have applications in business, education, game theory, modeling, health, information security, life sciences, manufacturing, and other related careers. Guided by the premise that technology is a business enabler, planning for our future information systems and related curricula is strongly aligned with the mission of the college:

*Ivy Tech Community College prepares Indiana residents to learn, live, and work in a diverse and globally competitive environment by delivering professional, technical, transfer, and lifelong education. Through its affordable, open-access education and training programs,*

*the College enhances the development of Indiana's citizens and communities and strengthens its economy.*

This program clearly fits into the college's current strategic plan, *Accelerating Greatness*, under Strategy 2: Ensure that Indiana citizens, workforce, and businesses are globally competitive

- Objective 2.1 Become a recognized leader in providing fundamental, applied, and technical knowledge and skills in programs that support Indiana's citizens and its economy
- Objective 2.2 Increase Ivy Tech's relevance and value to Indiana's employer community

The college works with employers to determine what skills they need from their employees while also providing training that meets a variety of needs – including associate degrees that result in jobs in high demand fields and that transfer to four-year colleges and universities.

The Computer Science program is expected to have an impact on future program developments. The increased capacity brought through this program – enhanced equipment, laboratory facilities and expanded coursework- will be building blocks for other future degree programs in related engineering and life sciences fields of study.

The college has a long history of providing related information technology education. The Computer Information Systems is one the oldest and largest programs in the college. The curriculum was based on the concept that for many years entry into this profession started with application programming. With the introduction of miniaturization and the distribution of personal computing both in organizations and to individuals in the broader population, other careers such as computing repair and networking became more popular. However, the business model for information systems continues to evolve and the power of technology continues to change the profession for those individuals pursuing a career in this area. For example, combinations of outsourcing and high order development tools have greatly reduced the number of traditional application programmers. Organizations large and small have shifted from in-house development of applications to purchased software.

In partial response to the technological evolution our faculty in 2005 and 2006 modified the curriculum and split courses into two groups – Computer Information Systems, and Computer Information Technology. While Computer Information Systems curriculum provides students with knowledge about programming languages, operating systems, database management systems, and web design, Computer Information Technology emphasizes network management and security, computer hardware and support and operating systems administration. The Computer Science curriculum completes the educational continuum of this discipline at the college.

#### **b. State Rationale**

Alignment with *Reaching Higher, Achieving More*

- Completion – creating clear, efficient pathways for on-time college completion  
Students who are balancing work and family responsibilities will benefit from the online course offerings to stay on track to on-time graduation in this program that requires 60 credit hours and is aligned to four-year curriculum for those who wish to complete a baccalaureate degree.
- Productivity – prioritizing resources to high-demand academic programs & reducing duplication of academic programs and services  
This is a new program for the college that complements existing information technology curriculum, and is expected to generate more enrollment in the college's higher level math and science courses.

**c. Evidence of Labor Market Need**

- i. National, State, or Regional Need**
- ii. ~~Preparation for Graduate Programs or Other Benefits~~ n/a**
- iii. Summary of Indiana DWD and/or U.S. Department of Labor Data**
- iv. National, State, or Regional Studies**

The Computer Science program can serve any geographic area with a concentration of employers in the information systems industry. With the concept of distributed computing that is now found in many areas of the state, large and smaller cities with the capability of supporting information technology will employ graduates from this program.

The academic areas of computer information systems and computer information technology are already large programs for the college. With the advent of an expanding advanced manufacturing and life science sectors throughout the state, computer science will become more integral to support not only the information technology sector but these other sectors, as well. The computer science sector can be described as a discipline that involves the understanding and design of computers and computational processes. The discipline spans the range from theory through programming to the cutting-edge development of computer solutions.

The computer science program would position our students to take several career paths. Besides transferring to a senior institution to complete their bachelor's degree, computer science majors may assist in the designing and implementation of new software. This discipline is also creative in such a way that graduates may also help devise new ways to use computers by innovatively applying computer technology to solve unique business issues. In addition computer science graduates can be involved in the planning managing of an organization's technological infrastructure.

Information technology is big business, and Indiana like many other states is increasingly seeking to attract this sector as a way to promote economic development. Information as noted earlier is integral to the growth of advanced manufacturing and the life sciences sectors given their dependence on the accurate processing of data that results in the creation of business information.

Communities are looking to attract information technology and their related sectors to their areas. Ivy Tech is being responsive to provide marketable and transferable education in computer science, to fill existing information technology jobs, and to work with communities as a catalyst for attracting high skill, high wage jobs to the marketplace. Further, the College is committed to encourage graduates to pursue further education in the field both at the undergraduate and graduate level.

Moreover, the state is just beginning to tap the power of technology. The digital age has vastly expanded individual access to all sorts of information and resources which include education materials. Simultaneously, the Internet has fostered a culture of sharing as there exists currently an exchange of content. New technologies such as Web 2.0 has blurred lines between content producers and consumers while creating a paradigm shift from a focus on the access of information to the access to other people. Why may this be important?

Computers certainly have evolved over the past forty years from the centralized, large mainframe operations largely kept from the public eye to the distributed network processing that have become integral to the business and individual work life found today. Computing of yesteryear supported scientific inquiry and large business enterprises. The computing of today especially with current networking technologies and cost reductions provide information to of individuals and small enterprises that was unknown in prior decades. For example, the miniaturization and power of network computing today allows for the use of sophisticated modeling techniques and gaming theory to advance societal, business, governmental, and individual goals.

The information industry is moving to blend the divide between providers and consumers of information in such a way that whole new industries are forming under the umbrella of new media. New media is a term meant to blend digital and computerization in a networked environment. This presents significant implications for training and education, entertainment, both mathematic and digital modeling, as well as a host of other industries. At its core foundation, all of this requires computer education to support the pieces and parts that include programming, networking, and management of large caches of information.

Indiana has both large and small companies engaged in various aspects of information technology including computer software engineers, applications, computer systems analysts, network systems and data communications, systems software, computer administrators, systems managers, and database administrators. The computer science program will align itself with economic development efforts initiated for Indiana not only in the information sector but also to support advanced manufacturing and the life sciences. While there are many employers capable of hiring our graduates, the state appears to be experiencing growth in the information sector. Recently, the Bloomington Economic Development Corporate completed a Request for Information from a major employer that could attract 1,300 new information jobs to Bloomington specifically and the state in general. Should this employer relocate to the area, the undisclosed company would invest approximately \$100 million in investment and training. The job opportunities for this and other employers in the state include server management, systems operations, database management, storage management, as well as project management.

The Indiana Department of Workforce Development identified in its *Hoosier Hot 50 Jobs Data* computer science, computer software, engineering and applications among its top jobs for the state. With the increasing state interest in both the life sciences and advanced manufacturing, Ivy Tech recognizes that information technology is a sector of high interest currently in the state and certainly represents significant potential employment area for our citizens.

The Computer Science program is designed for graduates to transfer to senior institutions for baccalaureate opportunities. According to the most recent U.S. Bureau of Labor Statistics survey, employment of computer scientists is expected to grow by 24 percent from 2008 to 2018. Similarly, the Department of Workforce Development's *Hoosier Hot 50 Jobs Data* project increases in computer science employment from between 2004 and 2014 from 3,920 to 5,670 or a 44% increase. Likewise, the state is expected to increase its database administration employment 37% from 1,600 to 2,200 individuals in the same time period. This degree program will position our students to be educated in complex information systems problem solving, as well as position our students for transfer to senior institutions. The need for computer engineers to design storage and information sharing systems, facilitate human-machine interaction, and develop complex algorithmic solutions will be a major factor in the rising demand for computer scientists.

The Indiana Economic Growth Regions (EGRs) in which these degrees will be offered rank computer software engineer, computer systems analysts, and computer/mathematics occupations as key occupational opportunities. According to the Indiana Department of Workforce Development website *Hoosiers by the Numbers*, EGR 1, EGR 7, EGR 10 and EGR 12 have the large projections of employment within computer software engineering in the state with between 26.4% and 32.4%, while EGR 2 and EGR 14 are 52.8% and 57.8%, respectively. Likewise, EGR 3 and EGR 4 show increase in employment projections within the computer systems analyst field with percentages of 17.6 and 26.8, respectively. These EGRs around the state have demonstrated an increase in companies inquiring about these related computer science fields.

The literature further notes that the Information Technology Associate of America reported in their Workforce 2003 report that the information systems industry essentially bottom out in 2002, and the number of jobs in this area began to regain their footing to the extent that The Bureau of Labor Statistics predicts additional increases in the number of jobs through the year 2014 (between 5 and 36 percent depending on job category). Similarly, computer science provides critical support for our STEM (science, technology, engineering and mathematics) fields, which are the necessary pillars for our state and country’s infrastructure for our continued survival in the global marketplace. The National Academies of Science, Engineering and Medicine in their 2007 study of “Rising Above the Gathering Storm,” as well as other authors suggest that our advantages in the marketplace of science and technology have begun to erode, which suggests that planning our future educational for computer education is important.

While the current economic conditions experienced in 2008 may contribute to a less than otherwise desired growth in jobs in information systems and other career fields, there are myths that must be countered as the college moves forward in this arena. Among the myths in this field include the notion that there are no jobs; that information system jobs are moving off-shore; and that information systems degrees are worthless. The information systems literature suggest otherwise. Jobs are being created in information systems as noted earlier in the bureau statistics, and career fields are developing in collateral fields because of the explosive growth in digital communications and related fields. While it is also true that jobs have been sent overseas to lower-cost areas of production, it remains true that highly skilled jobs related to a company’s core competency in information systems or their core business processes have remained in the United States. Finally, it should be noted that graduates with technical skills are needed; however, those students leaving education institutions with solid knowledge of business fundamentals, communications abilities both verbal and written, and those with abilities to analyze and propose solutions to business problems are and will continue to be valued above all.

**v. Surveys of Employers or Students and Analyses of Job Postings**

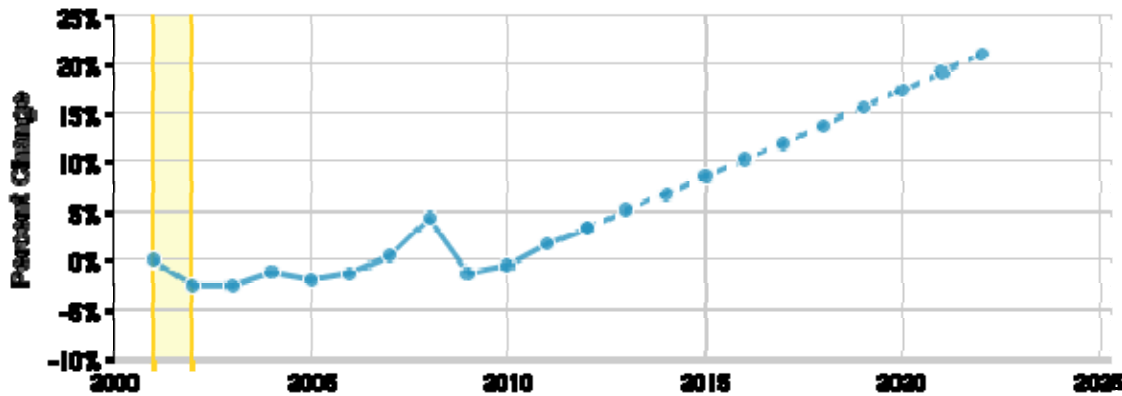
Sample of Recent Job Postings in Indiana  
 Computer Software Engineers, Applications

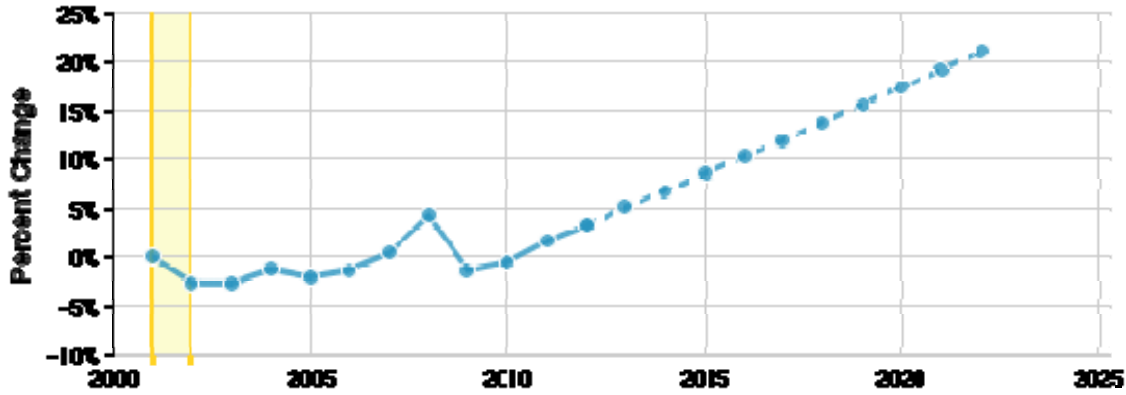
Annual Openings Estimate (2012) - 315

315

Current Job Postings

356





vi. Letters of Support

3. Cost of and Support for the Program

a. Costs

i. Faculty and Staff

Approximately 75% of the required coursework in the program are general education classes that are currently on the college inventory and support other programs of study. No new faculty and staff are required for these classes, although as enrollments build over the years, additional faculty will be added to meet the demand.

The following new programmatic coursework will be introduced to support the program:

**PROGRAM SPECIFIC CORE - 16 CREDITS**

CSCI	101	Computer Science I	3
CSCI	102	Computer Science II	3
CSCI	105	Discrete Logic for Computers	3
CSCI	202	Computer Science III	3
CSCI	210	Database Systems	3

**INSTITUTIONAL REQUIREMENT**

CSCI	279	Capstone Course	1
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The first year of implementation will require eight program chair faculty to be hired. Some of these positions will be new to the college and others will be filled by transferring faculty from existing program. Faculty employed in this position will have a minimum of a master’s degree in Computer Science or related field. Because the labs will be shared with other related programs, the college does not anticipate additional lab tech support as the program is launched.

**ii. Facilities**

The Computer Science Program on-site delivery will require a laboratory class room with additional computer hardware and software to support student learning along with audiovisual equipment and multimedia equipment for instruction. All campuses currently have adequate laboratory spaces to meet these needs.

**iii. Other Capital Costs (e.g. Equipment)**

The program will require additional software to support course competencies, and some will need to upgrade existing equipment. The average estimate per campus to initiate the program is \$10,000.

**b. Support**

**iv. Nature of Support (New, Existing, or Reallocated)**

Required faculty will be funded from a combination of funding from reallocated positions and grant funding, which is anticipated to be replaced by enrollment growth once the funding ceases.

**v. Special Fees above Baseline Tuition**

There are no additional program assessments planned for Computer Science majors. It is expected that some of the programmatic classes will include an additional course fee, estimated at \$15-\$30 and consistent with fees applied to other computer technology courses in the college inventory. Standard in-state and out-of-state tuition and fees for Ivy Tech students will apply to this program. The 2012-13 in-state tuition is \$111.15/credit hour. The fee for all Ivy Tech on-line courses, currently set at \$20/student, applies to classes taken via distance education methodology.

**4. Similar and Related Programs**

**a. List of Programs and Degrees Conferred**

**i. Similar Programs at Other Institutions**

A baccalaureate degree in Computer Science is offered at all major Indiana universities and at several of the regional campuses such as Purdue University Calumet and Indiana University Southeast. Several of the private colleges and universities, such as DePauw and Rose-Hulman Institute of Technology, also offer this major.

**ii. Related Programs at the Proposing Institution**

- Computer Information Systems – Associate of Applied Science and Technical Certificate
- Computer Information Technology – Associate of Applied Science and Technical Certificate

Computer science graduates advance the field of information technology (IT) through research and innovation. They are different from the bulk of IT professionals in that they focus on developing new technology rather than using or repairing existing technology, which is the primary focus of Ivy Tech’s existing degrees.

**b. List of Similar Programs Outside Indiana**

Nationwide, computer science and/or computer programming and engineering are commonly found at major community college such as Valencia in Florida and Sinclair as well as the on-line for profit institutions (University of Phoenix, Baker, Kaplan, etc.).

**c. Articulation of Associate/Baccalaureate Programs**

Ivy Tech’s Computer Science program is aligned with the Association for Computing Machinery (ACM) curricular recommendations, and thus contains content that would align itself with the senior institutions following the ACM standards.

The Associate of Science in Computer Science is designed for articulation into a Bachelor of Science in Computer Science or Applied Computer Science – a program that is either stand-alone curriculum or combined with mathematical sciences at many of the senior institutions throughout the state. The program has a signed articulation with the new “Applied Computer Science” degree from Indiana University – Purdue University – Indianapolis (Please see Appendix for articulation details). Other 4 year institutions have shown interest in articulating such as Indiana State University, an Indiana University Regional campus and several private institutions. The general education portion of the associate’s degree will transfer following the new general education transfer core, and the professional courses align with coursework at the four-year institutions.

**d. Collaboration with Similar or Related Programs on Other Campuses**

Ivy Tech campuses offering the program on-campus will collaborate to develop the statewide curriculum.

**5. Quality and Other Aspects of the Program**

**a. Credit Hours Required/Time To Completion – 60 credit hours**

Full time college-ready students are able to complete the program in a two year period

**b. Exceeding the Standard Expectation of Credit Hours – n/a**

**c. Program Competencies or Learning Outcomes**

**Computer Science  
Program Objectives**

- Demonstrate problem-solving strategies including the role, implementation strategies, and properties of algorithms.
- Manipulate and configure fundamental programming constructs: syntax and semantics, data types, numeric operations, control structures, functions, methods and parameter passing.
- Demonstrate understanding of object-oriented concepts of computer programming: classes, objects, inheritance, exception handling, GUI, and event-driven programming.
- Demonstrate an understanding of virtual machines, interpreters, and compilers in their use with programming languages.
- Discuss machine level representation of data including numeric representation and number bases and representation of character data.
- Understand and employ various search and sort algorithms.
- Demonstrate an understanding of database systems and database query languages, entity relationship modeling, and normalization
- Employ functions, relations, sets, digital logic, propositional logic, Boolean algebra, descriptive statistics, and elementary number theory.
- Exhibit an understanding of the importance of data backup, recovery and security
- Discuss the social context of computing: history and evolution of ideas and machines, social impact of the computer, professionalism, and code of ethics.
- Continue their education at a senior institution.

**d. Assessment**

Evaluation of the program will be done according to program review protocols currently in place at Ivy Tech Community College. These include enrollment trends, faculty trends, student performance, student retention, achievement of technical and general education outcomes, job placement, graduate follow-up surveys, and on-going evaluation by the program advisory committee.

- a. The student learning outcomes will be assessed and measured at the end of the student's program through a project based portfolio to be completed in the capstone course. The comprehensive project will be a complete computer program with source code, documentation, test data and results, and any additional materials that apply. A rubric will be designed by the faculty for this purpose.
- b. The overall performance of the program will be measured through the use of a standardized rubric scoring system. The students will be rated on the individual elements of the program using current "best practices" of the computer programming community.
- c. The main goal of an associate degree program is to produce graduates that transfer to baccalaureate programs to earn bachelor degrees in the corresponding field. The assessment will be used to measure how successful students of the program are in earning their baccalaureate degree.



d. The results of the assessment will be analyzed and compared to the goals and objectives of the program. These comparisons will be used to strengthen and revise areas of the individual courses to better meet the overall goals of the program.

**e. Licensure and Certification**

Currently there is no licensure or certifications incorporated in the Computer Science program. The Associate of Science in Computer Science is designed for articulation into a Bachelor of Science in Computer Science or Applied Computer Science.

**f. Placement of Graduates**

Computer science is a field that offers many career options to graduates across almost all economic sectors. An associate degree program in computer science could prepare students for careers various related positions, such as:

- Computer programmers
- Computer support specialists
- Systems analysts

Although some employers prefer that a computer technician or programmer has a bachelor's degree, employees may be hired with an associate's degree and some experience. Employers often provide additional on-the-job training.

Interested individuals may also choose to pursue a bachelor's degree in computer science and become computer software engineers, advanced computer programmers or systems managers or administrators. Additional certifications may improve employment and career advancement opportunities.

**g. Accreditation**

Currently, the Computer Science program has not selected a program specific accreditation body to establish accreditation. There are accrediting bodies for computer science such as the ACM, and their requirements were considered extensively in the development of this curriculum. Accreditation through the appropriate body will be sought upon successful implementation of the Computer Science program and in consultation with the primary transfer partners.

**6. Projected Headcount and FTE Enrollment and Degrees Conferred**

**Degree Conferred - Associate of Science in Computer Science**

**Enrollment projections noted in Appendix**

**Appendix I – Curriculum**

**COLLEGEWIDE CURRICULUM OF RECORD  
SCHOOL OF BUSINESS  
COMPUTER SCIENCE PROGRAM  
ASSOCIATE OF SCIENCE  
TRANSFER DEGREE  
2012-2013**

**GENERAL EDUCATION TRANSFER CORE - 30-34 CREDITS**

Composition and Communication

COMM	101	Fundamentals of Public Speaking	3
ENGL	111	English Composition	3

Mathematics: Choose one of the following courses – 6-9 Credits

MATH	136	College Algebra	3
MATH	137	Trigonometry with Analytic Geometry	3
MATH	201	Brief Calculus I	3
MATH	202	Brief Calculus II	3
MATH	211	Calculus I	4
MATH	212	Calculus II	4
MATH	221	Calculus for Technology I	3
MATH	222	Calculus for Technology II	3

Life/Physical Sciences: Choose two of the following courses - 6-10 Credits

APHY	101	Anatomy and Physiology I	3
APHY	102	Anatomy and Physiology II	3
ASTR	101	Solar System Astronomy	3
BIOL	100	Human Biology	3
BIOL	101	Introductory Biology	3
BIOL	105	Biology I	5
BIOL	107	Biology II	5
BIOL	121	General Biology I	4
BIOL	211	Microbiology I	3
CHEM	101	Introductory Chemistry I	3
CHEM	105	General Chemistry I	5
CHEM	106	General Chemistry II	5
CHEM	111	Chemistry I	4
CHEM	113	Introductory Organic and Biochemistry	3
PHYS	101	Physics I	4

PHYS	102	Physics II	4
PHYS	220	Mechanics	5
PHYS	221	Heat, Electricity, and Optics	5
SCIN	100	Earth Science	4
SCIN	111	Physical Science	3

Social and Behavioral Sciences: Choose two of the following courses - 3-6 Credits

ANTH	154	Cultural Anthropology	3
ECON	101	Economics Fundamentals	3
ECON	201	Principles of Macroeconomics	3
ECON	202	Principles of Microeconomics	3
POLS	101	Introduction to American Government and Politics	3
POLS	211	Introduction to World Politics	3
PSYC	101	Introduction to Psychology	3
PSYC	201	Lifespan Development	3
PSYC	205	Abnormal Psychology	3
PSYC	240	Human Sexuality	3
SOCI	111	Introduction to Sociology	3
SOCI	252	Social Problems	3

Humanities: Choose two of the following courses - 3 Credits

ARTH	101	Survey of Art and Culture I	3
ARTH	102	Survey of Art and Culture II	3
ARTH	110	Art Appreciation	3
ENGL	202	Creative Writing	3
ENGL	206	Introduction to Literature	3
ENGL	214	Introduction to Poetry	3
ENGL	220	Introduction to World Literature Through the Renaissance	3
ENGL	221	Introduction to World Literature After the Renaissance	3
ENGL	222	American Literature To 1865	3
ENGL	223	American Literature After 1865	3
HIST	101	Survey of American History I	3
HIST	102	Survey of American History II	3
HIST	111	World Civilization I	3
HIST	112	World Civilization II	3
HUMA	100	Theatre Appreciation	3
HUMA	118	Music Appreciation	3
PHIL	101	Introduction to Philosophy	3
PHIL	102	Introduction to Ethics	3
PHIL	220	Philosophy of Religion	3

Multicultural Awareness: Choose one of the following courses - 3-4 Credits

HIST	111	World Civilization I	3
HIST	112	World Civilization II	3
SOCI	164	Multicultural Studies	3
SOCI	245	Cultural Diversity	3
ANTH	154	Cultural Anthropology	3
FREN	201	French Level III	4
FREN	202	French Level IV	4
SPAN	201	Spanish Level III	4
SPAN	202	Spanish Level IV	4
<b>TOTAL</b>			<b>30-34</b>

**OTHER INSTITUTIONAL REQUIREMENTS - 2-4 CREDITS**

IVYT	1XX	Student Success Course	1-3
CSCI	279	Capstone Course	1
<b>TOTAL</b>			<b>2-4</b>

**PROGRAM SPECIFIC CORE - 15 CREDITS**

CSCI	101	Computer Science I	3
CSCI	102	Computer Science II	3
CSCI	105	Discrete Logic for Computers	3
CSCI	202	Computer Science III	3
CSCI	210	Database Systems	3
<b>TOTAL</b>			<b>15</b>

**TRANSFER CLUSTER - 9-15 CREDITS**

XXXX	XXX	Transfer Institution Electives	9-15
<b>TOTAL</b>			<b>9-15</b>

**TOTAL CREDITS 60-62**

^ Capstone Course

## **Appendix II - Course Descriptions**

### **CSCI 101, COMPUTER SCIENCE I**

COURSE TITLE: Computer Science I  
COURSE NUMBER: CSCI 101  
PREREQUISITES: MATH 136 College Algebra and MATH 137 Trigonometry with Analytic Geometry or Demonstrated competency through appropriate assessment  
COREQUISITES: MATH 211 Calculus I  
SCHOOL: Applied Sciences and Engineering Technology  
PROGRAM: Computer Science  
CREDIT HOURS: 3  
CONTACT HOURS: Lecture: 3  
DATE OF LAST REVISION: Fall, 2011  
EFFECTIVE DATE OF THIS REVISION: Fall, 2012

CATALOG DESCRIPTION: Introduces the fundamental concepts of procedural programming. Topics include data types, control structures, functions, arrays, files, and the mechanics of running, testing, and debugging. The course also offers an introduction to the historical and social context of computing and an overview of computer science as a discipline.

### **CSCI 102, COMPUTER SCIENCE II**

COURSE TITLE: Computer Science II  
COURSE NUMBER: CSCI 102  
PREREQUISITES: CSCI 101 Computer Science I  
COREQUISITES: CSCI 105 Discrete Logic for Computers  
SCHOOL: Applied Sciences and Engineering Technology  
PROGRAM: Computer Science  
CREDIT HOURS: 3  
CONTACT HOURS: Lecture: 3  
DATE OF LAST REVISION: Fall, 2011  
EFFECTIVE DATE OF THIS REVISION: Fall, 2012

CATALOG DESCRIPTION: Provides a working understanding of the fundamentals of procedural and object-oriented program development using structured, modular concepts and modern object-oriented programming languages. Reviews control structures, functions, data types, variables, arrays, and data file access methods. This is a first-level course in object-oriented computer programming, using a language such as Java or C++. Object-oriented concepts studied include classes, objects, inheritance, exception handling, recursion, abstract data types, streams and file I/O, reusable software, and event-driven programming.

### **CSCI 105, DISCRETE LOGIC FOR COMPUTERS**

COURSE TITLE: Discrete Logic for Computers  
COURSE NUMBER: CSCI 105  
PREREQUISITES: MATH 211 Calculus I or : Demonstrated competency through appropriate assessment or successful completion of MATH 131 Algebra/Trigonometry I and MATH 132 Algebra/Trigonometry II or

MATH 133 College Algebra with Analytic Geometry and MATH 134 Trigonometry or MATH 136 College Algebra and MATH 137 Trigonometry with Analytic Geometry  
SCHOOL: Applied Science and Engineering Technologies  
PROGRAM: Computer Science  
CREDIT HOURS: 3  
CONTACT HOURS: Lecture: 3  
DATE OF LAST REVISION: Fall, 2011  
EFFECTIVE DATE OF THIS REVISION: Fall, 2012

CATALOG DESCRIPTION: This course introduces students to discrete mathematical concepts including reasoning and proof, especially with the discrete phenomenon often used in the field of Computer Science. Students will learn the applicable mathematical vocabulary and its correct usage. Other topics include sets, functions, notation, proofs, proof techniques, relations, induction, counting and countability, probability, and partitions.

### **CSCI 202, COMPUTER SCIENCE III**

COURSE TITLE: Computer Science III  
COURSE NUMBER: CSCI 202  
PREREQUISITES: CSCI 102 Computer Science II  
SCHOOL: Applied Sciences and Engineering Technology  
PROGRAM: Computer Science  
CREDIT HOURS: 3  
CONTACT HOURS: Lecture: 3  
DATE OF LAST REVISION: Fall, 2011  
EFFECTIVE DATE OF THIS REVISION: Fall, 2012

CATALOG DESCRIPTION: Builds on the foundation of CSCI II to provide a working understanding of the fundamentals of data structures and algorithms used in modern computer programming. Introduces a variety of data storage alternatives, including stacks, queues, linked lists, hash tables, trees and graphs. Employs the basics of algorithmic analysis, recursion, language translation and software engineering. Discusses the overview, history and comparison of programming languages, as well as virtual machines and language translation.

### **CSCI 205, COMPUTER ORGANIZATION AND ARCHITECTURE**

COURSE TITLE: Computer Organization and Architecture  
COURSE NUMBER: CSCI 205  
PREREQUISITES: CSCI 202 Computer Science III  
SCHOOL: Applied Sciences and Engineering Technology  
PROGRAM: Computer Science  
CREDIT HOURS: 3  
CONTACT HOURS: 3  
DATE OF LAST REVISION: Fall, 2011  
EFFECTIVE DATE OF THIS REVISION: Fall, 2012

CATALOG DESCRIPTION: This course introduces the concepts related to the organization and architecture of digital computers. The course begins with a discussion of data representations (fixed, floating point numbers, ACSII, EBCDIC, etc.) as well as arithmetic operations. The course discusses

the architecture of instruction sets using both machine and assembly language applied to a simplified model of the commercial SPARC architecture. The importance of data path, timing, and control are presented. The processes of program compilation, assembly, linking and loading are covered. Considerable time is devoted to hardware-related topics such as memory, buses, peripherals, and networking. The course concludes with a presentation of advanced architectural concepts such as parallel and superscalar machines.

### **CSCI 210, DATABASE SYSTEMS**

**COURSE TITLE:** Database Systems  
**COURSE NUMBER:** CSCI 210  
**PREREQUISITE:** CSCI 105 Discrete Logic for Computers  
**SCHOOL:** Applied Science and Engineering  
**PROGRAM:** Computer Science  
**CREDIT HOURS:** 3  
**CONTACT HOURS:** 3  
**DATE OF LAST REVISION:** Fall, 2011  
**EFFECTIVE DATE OF THIS REVISION:** Fall, 2012

**CATALOG DESCRIPTION:** This course presents the theory and practice of database systems and gives an advanced introduction into the concepts for modeling, designing, querying, and managing large and distributed databases. The emphasis will be on theoretical considerations involved in modeling data and the principles of database systems in a multi-user environment. Students will address issues associated with enterprise database processing with respect to user authentication and development in an application/internet environment.

### **CSCI 279, CAPSTONE COURSE**

**COURSE TITLE:** Capstone Course  
**COURSE NUMBER:** CSCI 279  
**PREREQUISITES:** Program Advisor Approval  
**SCHOOL:** Applied Science and Engineering Technology  
**PROGRAM:** Computer Science  
**CREDIT HOURS:** 1  
**CONTACT HOURS:** Lecture: 1  
**DATE OF LAST REVISION:** Fall, 2011  
**EFFECTIVE DATE OF THIS REVISION:** Fall, 2012

**CATALOG DESCRIPTION:** Prepare the student for entry into the world of Computer Science. Reviews procedures for interviewing, team participation, and ethical and productive job performance. Provides for taking program outcomes assessments.

## Appendix III – Statewide and Regional Enrollment Projections

### Enrollment/Degree Projections and New State Funds Requested Date: June 2012

**I. Prepare by Institution**

Institution/Location: Ivy Tech Community College - Total for all Regions  
Program: Computer Science (CSCI)

	Year 1 FY2012	Year 2 FY2013	Year 3 FY2014	Year 4 FY2015	Year 5 FY2016
Enrollment Projections (Headcount)					
Full-Time	34	54	66	69	72
Part-Time	42	67	81	85	89
Total	76	122	147	154	162
Enrollment Projections (FTE)					
Full-Time	34	54	66	69	72
Part-Time	20	32	38	40	42
Total	54	86	104	109	114
Degree Completions Projections	0	0	13	14	26
New State Funds Requested (Actual) *	\$0	\$0	\$0	\$0	\$0
New State Funds Requested (Increase) *	\$0	\$0	\$0	\$0	\$0

**II. Prepared by CHE**

New State Funds To Be Considered For Recommendation (Actual) *	\$0	\$0	\$0	\$0	\$0
New State Funds To Be Considered For Recommendation (Increases) *	\$0	\$0	\$0	\$0	\$0

CHE Code:  
Campus Code:  
County:  
Degree Level:  
CIP Code:  
    Federal -  
    State -



**Enrollment/Degree Projections and New State Funds Requested**

Date: June 2012

**I. Prepare by Institution**

Institution/Location: **Ivy Tech Community College - Region 1 - Valparaiso**  
 Program: **Computer Science (CSCI)**

	Year 1 FY2012	Year 2 FY2013	Year 3 FY2014	Year 4 FY2015	Year 5 FY2016
Enrollment Projections (Headcount)					
Full-Time	<u>3</u>	<u>5</u>	<u>6</u>	<u>6</u>	<u>6</u>
Part-Time	<u>6</u>	<u>10</u>	<u>12</u>	<u>12</u>	<u>13</u>
Total	<u>9</u>	<u>14</u>	<u>17</u>	<u>18</u>	<u>19</u>
Enrollment Projections (FTE)					
Full-Time	<u>3</u>	<u>5</u>	<u>6</u>	<u>6</u>	<u>6</u>
Part-Time	<u>3</u>	<u>5</u>	<u>5</u>	<u>6</u>	<u>6</u>
Total	<u>6</u>	<u>9</u>	<u>11</u>	<u>12</u>	<u>12</u>
Degree Completions Projections	<u>0</u>	<u>0</u>	<u>1</u>	<u>1</u>	<u>3</u>
New State Funds Requested (Actual) *	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>
New State Funds Requested (Increase) *	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>

**II. Prepared by CHE**

New State Funds To Be Considered For Recommendation (Actual) *	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>
New State Funds To Be Considered For Recommendation (Increases) *	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>

CHE Code:  
 Campus Code:  
 County:  
 Degree Level:  
 CIP Code:  
     Federal -  
     State -

**Enrollment/Degree Projections and New State Funds Requested**

Date: June 2012

**I. Prepare by Institution**

Institution/Location: **Ivy Tech Community College - Region 2 - South Bend**  
 Program: **Computer Science (CSCI)**

	Year 1 FY2012	Year 2 FY2013	Year 3 FY2014	Year 4 FY2015	Year 5 FY2016
Enrollment Projections (Headcount)					
Full-Time	<u>4</u>	<u>6</u>	<u>8</u>	<u>8</u>	<u>9</u>
Part-Time	<u>3</u>	<u>5</u>	<u>6</u>	<u>6</u>	<u>6</u>
Total	<u>7</u>	<u>11</u>	<u>14</u>	<u>14</u>	<u>15</u>
Enrollment Projections (FTE)					
Full-Time	<u>4</u>	<u>6</u>	<u>8</u>	<u>8</u>	<u>9</u>
Part-Time	<u>1</u>	<u>2</u>	<u>3</u>	<u>3</u>	<u>3</u>
Total	<u>5</u>	<u>9</u>	<u>10</u>	<u>11</u>	<u>12</u>
Degree Completions Projections	<u>0</u>	<u>0</u>	<u>2</u>	<u>1</u>	<u>3</u>
New State Funds Requested (Actual) *	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>
New State Funds Requested (Increase) *	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>

**II. Prepared by CHE**

New State Funds To Be Considered For Recommendation (Actual) *	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>
New State Funds To Be Considered For Recommendation (Increases) *	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>

CHE Code:  
 Campus Code:  
 County:  
 Degree Level:  
 CIP Code:  
     Federal -  
     State -

**Enrollment/Degree Projections and New State Funds Requested**  
Date: June 2012

**I. Prepare by Institution**

Institution/Location: Ivy Tech Community College - Region 3 - Fort Wayne  
Program: Computer Science (CSCI)

	Year 1 FY2012	Year 2 FY2013	Year 3 FY2014	Year 4 FY2015	Year 5 FY2016
Enrollment Projections (Headcount)					
Full-Time	3	5	6	6	6
Part-Time	6	10	12	12	13
Total	9	14	17	18	19
Enrollment Projections (FTE)					
Full-Time	3	5	6	6	6
Part-Time	3	5	5	6	6
Total	6	9	11	12	12
Degree Completions Projections	0	0	1	1	3
New State Funds Requested (Actual) *	\$0	\$0	\$0	\$0	\$0
New State Funds Requested (Increase) *	\$0	\$0	\$0	\$0	\$0

**II. Prepared by CHE**

New State Funds To Be Considered For Recommendation (Actual) *	\$0	\$0	\$0	\$0	\$0
New State Funds To Be Considered For Recommendation (Increases) *	\$0	\$0	\$0	\$0	\$0

CHE Code:  
Campus Code:  
County:  
Degree Level:  
CIP Code -  
  Federal -  
  State -

**Enrollment/Degree Projections and New State Funds Requested**  
Date: June 2012

**I. Prepare by Institution**

Institution/Location: Ivy Tech Community College - Region 4 - Lafayette  
Program: Computer Science (CSCI)

	Year 1 FY2012	Year 2 FY2013	Year 3 FY2014	Year 4 FY2015	Year 5 FY2016
Enrollment Projections (Headcount)					
Full-Time	4	6	8	8	9
Part-Time	6	10	12	12	13
Total	10	16	19	20	21
Enrollment Projections (FTE)					
Full-Time	4	6	8	8	9
Part-Time	3	5	5	6	6
Total	7	11	13	14	15
Degree Completions Projections	0	0	2	2	3
New State Funds Requested (Actual) *	\$0	\$0	\$0	\$0	\$0
New State Funds Requested (Increase) *	\$0	\$0	\$0	\$0	\$0

**II. Prepared by CHE**

New State Funds To Be Considered For Recommendation (Actual) *	\$0	\$0	\$0	\$0	\$0
New State Funds To Be Considered For Recommendation (Increases) *	\$0	\$0	\$0	\$0	\$0

CHE Code:  
Campus Code:  
County:  
Degree Level:  
CIP Code -  
  Federal -  
  State -

**Enrollment/Degree Projections and New State Funds Requested**

Date: June 2012

**I. Prepared by Institution**

Institution/Location: **Ivy Tech Community College - Region 7 - Terre Haute**  
 Program: **Computer Science (CSCI)**

	Year 1 FY2012	Year 2 FY2013	Year 3 FY2014	Year 4 FY2015	Year 5 FY2016
<b>Enrollment Projections (Headcount)</b>					
Full-Time	<u>3</u>	<u>5</u>	<u>6</u>	<u>6</u>	<u>6</u>
Part-Time	<u>6</u>	<u>10</u>	<u>12</u>	<u>12</u>	<u>13</u>
Total	<u>9</u>	<u>14</u>	<u>17</u>	<u>18</u>	<u>19</u>
<b>Enrollment Projections (FTE)</b>					
Full-Time	<u>3</u>	<u>5</u>	<u>6</u>	<u>6</u>	<u>6</u>
Part-Time	<u>3</u>	<u>5</u>	<u>5</u>	<u>6</u>	<u>6</u>
Total	<u>6</u>	<u>9</u>	<u>11</u>	<u>12</u>	<u>12</u>
<b>Degree Completions Projections</b>	<u>0</u>	<u>0</u>	<u>1</u>	<u>1</u>	<u>3</u>
<b>New State Funds Requested (Actual) *</b>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>
<b>New State Funds Requested (Increase) *</b>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>

**II. Prepared by CHE**

<b>New State Funds To Be Considered For Recommendation (Actual) *</b>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>
<b>New State Funds To Be Considered For Recommendation (Increases) *</b>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>

CHE Code:  
 Campus Code:  
 County:  
 Degree Level:  
 CIP Code:  
 Federal -  
 State -

**Enrollment/Degree Projections and New State Funds Requested**

Date: June 2012

**I. Prepared by Institution**

Institution/Location: **Ivy Tech Community College - Region 10 - Columbus**  
 Program: **Computer Science (CSCI)**

	Year 1 FY2012	Year 2 FY2013	Year 3 FY2014	Year 4 FY2015	Year 5 FY2016
Enrollment Projections (Headcount)					
Full-Time	<u>5</u>	<u>8</u>	<u>10</u>	<u>10</u>	<u>11</u>
Part-Time	<u>2</u>	<u>3</u>	<u>4</u>	<u>4</u>	<u>4</u>
Total	<u>7</u>	<u>11</u>	<u>14</u>	<u>14</u>	<u>15</u>
Enrollment Projections (FTE)					
Full-Time	<u>5</u>	<u>8</u>	<u>10</u>	<u>10</u>	<u>11</u>
Part-Time	<u>1</u>	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>
Total	<u>6</u>	<u>10</u>	<u>11</u>	<u>12</u>	<u>13</u>
Degree Completions Projections	<u>0</u>	<u>0</u>	<u>2</u>	<u>2</u>	<u>3</u>
New State Funds Requested (Actual) *	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>
New State Funds Requested (Increase) *	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>

**II. Prepared by CHE**

New State Funds To Be Considered For Recommendation (Actual) *	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>
New State Funds To Be Considered For Recommendation (Increases) *	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>

CHE Code:  
 Campus Code:  
 County:  
 Degree Level:  
 CIP Code:  
     Federal -  
     State -

**Enrollment/Degree Projections and New State Funds Requested**  
Date: June 2012

**I. Prepared by Institution**

Institution/Location: **Ivy Tech Community College - Region 14 - Bloomington**  
Program: **Computer Science (CSCI)**

	Year 1 FY2012	Year 2 FY2013	Year 3 FY2014	Year 4 FY2015	Year 5 FY2016
<b>Enrollment Projections (Headcount)</b>					
Full-Time	<u>5</u>	<u>8</u>	<u>10</u>	<u>10</u>	<u>11</u>
Part-Time	<u>3</u>	<u>5</u>	<u>6</u>	<u>6</u>	<u>6</u>
<b>Total</b>	<u>8</u>	<u>13</u>	<u>15</u>	<u>16</u>	<u>17</u>
<b>Enrollment Projections (FTE)</b>					
Full-Time	<u>5</u>	<u>8</u>	<u>10</u>	<u>10</u>	<u>11</u>
Part-Time	<u>1</u>	<u>2</u>	<u>3</u>	<u>3</u>	<u>3</u>
<b>Total</b>	<u>6</u>	<u>10</u>	<u>12</u>	<u>13</u>	<u>14</u>
<b>Degree Completions Projections</b>	<u>0</u>	<u>0</u>	<u>2</u>	<u>2</u>	<u>3</u>
<b>New State Funds Requested (Actual) *</b>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>
<b>New State Funds Requested (Increase) *</b>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>

**II. Prepared by CHE**

<b>New State Funds To Be Considered For Recommendation (Actual) *</b>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>
<b>New State Funds To Be Considered For Recommendation (Increases) *</b>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>

CHE Code:  
Campus Code:  
County:  
Degree Level:  
CIP Code:  
Federal -  
State -

**Enrollment/Degree Projections and New State Funds Requested**

Date: June 2012

**I. Prepare by Institution**

Institution/Location: Ivy Tech Community College - Region 14 - Bloomington  
 Program: Computer Science (CSC1)

	Year 1 FY2012	Year 2 FY2013	Year 3 FY2014	Year 4 FY2015	Year 5 FY2016
Enrollment Projections (Headcount)					
Full-Time	<u>4</u>	<u>6</u>	<u>8</u>	<u>8</u>	<u>9</u>
Part-Time	<u>4</u>	<u>6</u>	<u>8</u>	<u>8</u>	<u>9</u>
Total	<u>8</u>	<u>13</u>	<u>15</u>	<u>16</u>	<u>17</u>
Enrollment Projections (FTE)					
Full-Time	<u>4</u>	<u>6</u>	<u>8</u>	<u>8</u>	<u>9</u>
Part-Time	<u>2</u>	<u>3</u>	<u>4</u>	<u>4</u>	<u>4</u>
Total	<u>6</u>	<u>9</u>	<u>11</u>	<u>12</u>	<u>13</u>
Degree Completions Projections	<u>0</u>	<u>0</u>	<u>2</u>	<u>2</u>	<u>3</u>
New State Funds Requested (Actual) *	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>
New State Funds Requested (Increase) *	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>

**II. Prepared by CHE**

New State Funds To Be Considered For Recommendation (Actual) *	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>
New State Funds To Be Considered For Recommendation (Increases) *	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>

CHE Code:  
 Campus Code:  
 County:  
 Degree Level:  
 CIP Code:  
     Federal -  
     State -

## Appendix IV – Program Articulation

### ARTICULATION AGREEMENT

Between  
Indiana University - Purdue University - Indianapolis  
and  
Ivy Tech Community College Statewide

For Transfer of Ivy Tech Community College's Associate of Science in Computer Science to  
Indiana University - Purdue University – Indianapolis Bachelor of Arts in Applied Computer  
Science

#### **Statement of Purpose**

The purpose of this articulation is to provide a basis for a cooperative relationship between Indiana University - Purdue University – Indianapolis (IUPUI) and Ivy Tech Community College (ITCC) to benefit students who desire to complete a bachelor's degree. The intent is for ITCC students completing the AS degree plan to move seamlessly to the BA degree plan.

#### **Transfer Agreement**

Graduates from 2012 onward of Ivy Tech Community College with an Associate of Science from any Ivy Tech campus may transfer and apply 60 - 64 credits from that completed degree to requirements for Indiana University - Purdue University – Indianapolis Bachelor of Arts in Applied Computer Science.

#### *Addendum One: Ivy Tech Community College Curriculum*

Transfer General Education Core Requirements  
Associate of Science Course Requirements

#### *Addendum Two: Course Requirements for Transfer*

Details the course requirements for this transfer agreement, including remaining courses required at the accepting college or university (transfer institution) to fulfill the baccalaureate degree requirements. If listed, please include a sample semester sequence.

#### *Addendum Three: Transfer Cluster Courses*

Lists course requirements or recommendations from the accepting college or university. These may be specific courses or suggested/required categories.

Additionally, under the terms of this agreement:

1. Ivy Tech students are eligible for admission with junior standing to Indiana University - Purdue University – Indianapolis provided:
  - a. The student has submitted a complete application for admission Indiana University - Purdue University – Indianapolis.





- b. A course grade of "C" or better must be earned to be accepted for transfer.
- c. The student has a 2.0 or higher grade point average on a 4 point scale.

2. As ITCC graduates complete the 60-62 credit hour requirements for the award of the BS degree, they must meet the graduation requirements as approved by the Indiana University - Purdue University – Indianapolis at the time of the student's admission to Indiana University - Purdue University – Indianapolis.
3. Written notice of intention to terminate, modify, or withdraw from this Articulation Agreement will be submitted by the academic head of either institution at least one academic semester prior to the proposed date of termination/withdrawal. Should a decision be made to modify or dissolve this agreement, students who are already attending Indiana University - Purdue University – Indianapolis at the time will be permitted to continue as long as their academic performance remains in good standing.
4. Recognizing that changes in curricula and course content are inevitable, each institution agrees to discuss with the other institution all curriculum changes affecting this agreement before the changes are implemented.
5. A review of this agreement and the resulting programs will take place every three years by the representatives from both institutions.


Agreed to March 30<sup>th</sup>, 2012.

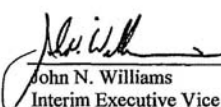
Ivy Tech Community College

  
\_\_\_\_\_  
Mary E. Ostrye  
Senior Vice President & Provost

  
\_\_\_\_\_  
Robert C. Deadman  
Assistant Vice President, Business,  
Computing Technology, and Logistics

University

  
\_\_\_\_\_  
Simon J. Rhodes  
Dean, School of Science

  
\_\_\_\_\_  
John N. Williams  
Interim Executive Vice Chancellor &  
Dean of the Faculties

## Addendum One: Ivy Tech Community College Curriculum

### Transfer General Education Core Requirements

**Composition** 3 credits  
ENGL 111 English Composition\*

**Communication** 3 credits  
COMM 101 Fundamentals of Public Speaking\*

**Mathematics** 3-4 credits  
MATH 135 Finite Math\*; MATH 136 College Algebra\*; MATH 137 Trig with Analytic Geometry\*;  
MATH 201 Brief Calculus\*; MATH 211 Calculus I\*; MATH 118 Concepts in Mathematics\*

**Life/Physical Science** 6-8 credits  
APHY 101 Anatomy & Physiology I; APHY 102 Anatomy & Physiology II; ASTR 101 Solar System  
Astronomy\*; BIOL 100 Human Biology\*; BIOL 101 Introductory Biology\*; BIOL 105 Biology I\*;  
BIOL 107 Biology II\*; BIOL 211 Microbiology I\*; CHEM 101 Introductory Chemistry\*; CHEM 105  
General Chemistry I\*; CHEM 106 General Chemistry II\*; CHEM 111 Chemistry I; CHEM 113  
Introductory Organic and Biochemistry\*; PHYS 101 Physics I\*; PHYS 102 Physics II\*; PHYS 220  
Mechanics\*; SCIN 100 Earth Science\*; SCIN 111 Physical Science\*

**Social/Behavioral Sciences** 6 credits  
ANTH 154 Cultural Anthropology; ECON 101 Economics Fundamentals\*; ECON 201 Principles of  
Economics\*; ECON 202 Principles of Microeconomics\*; POLS 101 Introduction to American  
Government and Politics\*; POLS 211 Introduction to World Politics\*; PSYC 101 Introduction to  
Psychology\*; PSYC 201 Lifespan Development\*; PSYC 205 Abnormal Psychology\*; PSYC 240 Human  
Sexuality\*; SOCI 111 Introduction to Sociology\*; SOCI 252 Social Problems\*

**Humanities** 6 credits  
ARTH 101 Survey of Art & Culture\*; ARTH 102 Survey of Art and Culture II\*; ARTH 110 Art  
Appreciation\*; ENGL 202 Creative Writing\*; ENGL 206 Introduction to Literature\*; ENGL 214  
Introduction to Poetry\*; ENGL 220 Introduction to World Literature\*; ENGL 221 Introduction to World  
Literature After the Renaissance\*; ENGL 222 American Literature to 1865\*; ENGL 223 American  
Literature After 1865\*; HIST 101 Survey of American History I\*; HIST 102 Survey of American  
History II\*; HIST 111 World Civilization I; HIST 112 World Civilization II; HUMA 100 Theatre  
Appreciation\*; HUMA 118 Music Appreciation\*; PHIL 101 Introduction to Philosophy\*; PHIL 102  
Introduction to Ethics\*; PHIL 220 Philosophy of Religion\*

**Multicultural Awareness** 3-4 credits  
HIST 111 World Civilization I; HIST 112 World Civilization II; SOCI 164 Multicultural Studies; SOCI  
245 Cultural Diversity; ANTH 154 Cultural Anthropology; FREN 201 French Level 3\*; FREN 202  
French Level 4\*; SPAN 201 Spanish Level 3\*; SPAN 202 Spanish Level 4\*

**Total Transfer Core** 30-34credits

\*CTL courses

**SAMPLE**

**Computer Science Program  
Associate of Science  
2012-2013**

The following suggested sequence includes all course requirements for this degree. You must consult with an academic advisor to determine which Transfer Cluster Electives should be chosen to receive the most credit at the receiving college or university.

**Semester 1**

CSCI 101	Computer Science I	3 Credits
ENGL 111	English Composition	3 Credits
IVYT 1XX	Student Success elective	1-3 Credits
MATH XXX	Mathematics Elective* – Note: MATH 211 is required	3-4 Credits
XXXX XXX	Life/Physical Sciences Elective	3-4 Credits
XXXX XXX	Social/ Behavioral Sciences	3 Credits
	<b>Semester Total</b>	<b>17-20 Credits</b>

**Semester 2**

CSCI 102	Computer Science II	3 Credits
COMM 101	Fundamentals of Public Speaking	3 Credits
XXXX XXX	Life/Physical Sciences Elective	3-4 Credits
XXXX XXX	Social/ Behavioral Sciences	3 Credits
CSCI XXX	CSCI Statewide Elective	3 Credits
	<b>Semester Total</b>	<b>15-16 Credits</b>

**Semester 3**

CSCI 105	Discrete Mathematics for Computer Science	3 Credits
CSCI 202	Computer Science III	3 Credits
XXXX XXX	Multicultural Elective	3-4 Credits
CSCI XXX	CSCI Statewide Elective	3 Credits
CSCI XXX	CSCI Statewide Elective	3 Credits
	<b>Semester Total</b>	<b>15-16 Credits</b>

**Semester 4**

CSCI 210	Database Systems	3 Credits
CSCI XXX	CSCI Statewide Elective	3 Credits
CSCI XXX	CSCI Statewide Elective	3 Credits
XXXX XXX	Humanities Elective	3 Credits
XXXX XXX	Humanities Elective	3 Credits
CSCI 279	Capstone course	1 Credit
	<b>Semester Total</b>	<b>16 Credits</b>

\*Required for Transfer General Education Core Certificate; MATH 118, Concepts in Mathematics and MATH 135, Finite Mathematics are not appropriate selections to satisfy the Mathematics requirement.

**Addendum Two: Course Requirements for Transfer**

**COLLEGEWIDE CURRICULUM OF RECORD  
SCHOOL OF BUSINESS  
COMPUTER SCIENCE PROGRAM  
ASSOCIATE OF SCIENCE  
Indiana University - Purdue University - Indianapolis  
TRANSFER DEGREE  
2012-2013**

**GENERAL EDUCATION TRANSFER CORE - 30-34 CREDITS**

Composition and Communication

COMM	101	Fundamentals of Public Speaking	3
ENGL	111	English Composition	3

Mathematics: Choose one of the following courses - 3-4 Credits

MATH	118	Concepts in Mathematics	3
MATH	135	Finite Math	3
MATH	136	College Algebra	3
MATH	137	Trigonometry with Analytic Geometry	3
MATH	201	Brief Calculus I	3
MATH	211	Calculus I	4

Life/Physical Sciences: Choose two of the following courses - 6-8 Credits

APHY	101	Anatomy and Physiology I	3
APHY	102	Anatomy and Physiology II	3
ASTR	101	Solar System Astronomy	3
BIOL	100	Human Biology	3
BIOL	101	Introductory Biology	3
BIOL	105	Biology I	5
BIOL	107	Biology II	5
BIOL	211	Microbiology I	3
CHEM	101	Introductory Chemistry I	3
CHEM	105	General Chemistry I	5
CHEM	106	General Chemistry II	5
CHEM	111	Chemistry I	4
CHEM	113	Introductory Organic and Biochemistry	3
PHYS	101	Physics I	4
PHYS	102	Physics II	4
PHYS	220	Mechanics	5

SCIN	100	Earth Science	4
SCIN	111	Physical Science	3

Social and Behavioral Sciences: Choose two of the following courses - 6 Credits

ANTH	154	Cultural Anthropology	3
ECON	101	Economics Fundamentals	3
ECON	201	Principles of Macroeconomics	3
ECON	202	Principles of Microeconomics	3
POLS	101	Introduction to American Government and Politics	3
POLS	211	Introduction to World Politics	3
PSYC	101	Introduction to Psychology	3
PSYC	201	Lifespan Development	3
PSYC	205	Abnormal Psychology	3
PSYC	240	Human Sexuality	3
SOCI	111	Introduction to Sociology	3
SOCI	252	Social Problems	3

Humanities: Choose two of the following courses - 6 Credits

ARTH	101	Survey of Art and Culture I	3
ARTH	102	Survey of Art and Culture II	3
ARTH	110	Art Appreciation	3
ENGL	202	Creative Writing	3
ENGL	206	Introduction to Literature	3
ENGL	214	Introduction to Poetry	3
ENGL	220	Introduction to World Literature Through the Renaissance	3
ENGL	221	Introduction to World Literature After the Renaissance	3
ENGL	222	American Literature To 1865	3
ENGL	223	American Literature After 1865	3
HIST	101	Survey of American History I	3
HIST	102	Survey of American History II	3
HIST	111	World Civilization I	3
HIST	112	World Civilization II	3
HUMA	100	Theatre Appreciation	3
HUMA	118	Music Appreciation	3
PHIL	101	Introduction to Philosophy	3
PHIL	102	Introduction to Ethics	3
PHIL	220	Philosophy of Religion	3

Multicultural Awareness: Choose one of the following courses - 3-4 Credits

HIST	111	World Civilization I	3
HIST	112	World Civilization II	3

SOCI	164	Multicultural Studies	3
SOCI	245	Cultural Diversity	3
ANTH	154	Cultural Anthropology	3
FREN	201	French Level III	4
FREN	202	French Level IV	4
SPAN	201	Spanish Level III	4
SPAN	202	Spanish Level IV	4
<b>TOTAL</b>			<b>30-34</b>
<b>OTHER INSTITUTIONAL REQUIREMENTS - 2-4 CREDITS</b>			
IVYT	1XX	Student Success Course	1-3
CSCI	279	Capstone Course	1
<b>TOTAL</b>			<b>2-4</b>
<b>PROGRAM SPECIFIC CORE - 15 CREDITS</b>			
CSCI	101	Computer Science I	3
CSCI	102	Computer Science II	3
CSCI	105	Discrete Mathematics for Computer Science	3
CSCI	202	Computer Science III	3
CSCI	210	Database Systems	3
<b>TOTAL</b>			<b>15</b>
<b>TRANSFER CLUSTER - 9-15 CREDITS</b>			
ANTH	154	Cultural Anthropology	3
CINS	157	Web Site Development	3
HIST	112	World Civilization II	3
MATH	137	Trigonometry with Analytic Geometry	3
Choose one of the following:			
ASTR	101	Solar System Astronomy	3
SCIN	100	Earth Science	4
<b>TOTAL</b>			<b>9-15</b>
<b>TOTAL CREDITS</b>			<b>60-62</b>
^ Capstone Course			

# Transfer Chart

## PROGRAM SPECIFIC CORE - 15 CREDITS

Ivy Tech Community College			Indiana University – Purdue University Indianapolis			
CSCI	101	Computer Science I	3	CSCI	230 Computing I	4
CSCI	102	Computer Science II	3	CSCI	240 Computing II	4
CSCI	105	Discrete Mathematics for Computer Science	3	CSCI	XXX N-Series Elective	3
CSCI	202	Computer Science III	3	CSCI	N211 Introduction to Databases	3
CSCI	210	Database Systems	3			

## TRANSFER CLUSTER - 9-15 CREDITS

Ivy Tech Community College			Indiana University – Purdue University Indianapolis			
ANTH	154	Cultural Anthropology	3	ANTH	A104 Cultural Anthropology	3
CINS	157	Web Site Development	3	CSCI	N241 Fundamentals Web Development	3
HIST	112	World Civilization II	3	HIST	114 History of Western Civilization 2	3
MATH	137	Trigonometry with Analytic Geometry	3	MATH	154 Algebra & Trigonometry II	3

Choose one of the following:

ASTR	101	Solar System Astronomy	3	AST	A100 The Solar System	3
SCIN	100	Earth Science	4	GEOL	G110 Physical Geology	3

### Sample Semester Sequence

#### Fifth Semester (15)

STAT 30100	Elem. Stat. Methods	3
CSCI 34000	Discrete Computational Structures	3
TCM 32000	Technical Writing for Science & Industry	3
CSCI N361	Fund. Software Project Management	3
or		
INFO I400	Project Management	
INFO I300	Human-Computer Interaction	3

#### Sixth Semester (15)

	Elective Foreign Language	3
CSCI 36200	Data Structures	3
CSCI NXXX	Applied CSCI Elective	3
CSCI NXXX	Applied CSCI Elective	3
	Elective Physical Science	3

#### Seventh Semester (15)

	Elective Foreign Language	3
CSCI 30000/40000	Level Elective	3
CSCI 30000/40000	Level Elective	3
CSCI 30000/40000	Level Elective	3
	Elective Physical Science	3

#### Eighth Semester (16)

CSCI 49500	Explorations in Applied Computing	3
CSCI NXXX	Applied CSCI Elective	3
CSCI 30000/40000	Level Elective	3
CSCI 30000/40000	Level Elective	3
	Elective Foreign Language	4

**Total Credit Requirement at Indiana University - Purdue University - Indianapolis**  
**120 credits**

### Addendum Three: Transfer Cluster Courses



The following courses or discipline categories are recommended or required to fulfill Ivy Tech Community College's Transfer Cluster requirement for students pursuing the Bachelor of Science degree from Indiana University - Purdue University - Indianapolis:

**TRANSFER CLUSTER - 9-15 CREDITS**

ANTH	154	Cultural Anthropology	3
CINS	157	Web Site Development	3
HIST	112	World Civilization II	3
MATH	137	Trigonometry with Analytic Geometry	3

Choose one of the following:

ASTR	101	Solar System Astronomy	3
SCIN	100	Earth Science	4
<b>TOTAL</b>			<b>9-15</b>