Certificate in Computer Applications

Proposed by

Department of Computer and Information Sciences

Indiana University South Bend

Fall 2003
Indiana University South Bend
Department of Computer and Information Sciences
Proposal For a New Certificate

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<th>Campus:</th>
<th>South Bend</th>
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<td>Proposed Title:</td>
<td>Certificate in Computer Applications</td>
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<td>Proposed Date of Implementation:</td>
<td>Fall 2004</td>
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I. Why is the certificate needed?

The rapid growth and demands of our information society continue to challenge our workforce. Today, many professionals have found themselves in the difficult position of developing, maintaining or managing complex information systems without formal training or knowledge of computer applications. Examples of such cases can be found in many organizations including health care, science and engineering, government, and not-for-profit agencies. The goal of this certificate is to provide the necessary technical expertise to those who currently hold such positions or those who are considering such positions in the future and need solid knowledge and expertise in the use and integration of computer applications.

II. Curriculum and major topics of the program

The certificate will consist of six courses (19 credits) and will provide the student with the knowledge and understanding of computer hardware and software components and how they operate, use of common office automation and productivity application software, introduction to operating systems, introduction to event driven programming and graphical user interfaces, introduction to web based programming, introduction to computer networks and the client/server computing model.

The above topics provide a coherent three tiered pyramid model consisting of the following components: Literacy, Concepts and Tools.

Certificate in Computer Applications - 4/10/2004
# Course Descriptions

**A106 Introduction to Computing (3 cr.)**
Fundamentals of computer hardware and software; use of packaged programs in areas such as word processing, spreadsheets, database management, communications, graphics; the role and impact of computers in society. Course is designed for people with little or no computer experience. One class per week is spent in the microcomputer teaching laboratory. (INFO 101 or BUSB 1201 can be substituted for this course.)

**A107 Advanced Microcomputing (4 cr.)**
P. A106 or equivalent. This course is designed to increase students' ability to perform tasks using the personal computer. Advanced study and use of the Microsoft Office productivity suite (Word, Excel, Access, PowerPoint) will be one focus of the course with an emphasis on database systems. We will also show how the Office capabilities can be enhanced through the use of programming. The course will also examine the design, construction and publishing of web pages. Furthermore, various topics in computing, networking, and the use of personal computers will be covered.

**A150 Understanding Operating Systems (1 cr.)**
P. A106 or equivalent. Study of the basic concepts of operating systems, understanding the role of operating systems in providing a virtual machine interface. Understanding the relationship between the hardware and operating system. Survey of the user level operating system facilities and commands.

**A201 - Introduction to Programming I (4 cr.)**
P. M014, A106. Fundamental programming constructs, including loops, arrays, classes, and files. General problem-solving techniques. Emphasis on modular programming, user-interface design, and developing good programming style. Not intended for computer science majors. (Contemporary language such as Visual Basic or Java.)

**A338 Network Tech & Systems Administration (4 Cr.)**
P. A150. Introduction to network principles and current network technology, both hardware and software. Network administration tools and techniques. Laboratory provides practical experience.

**A340 Introduction to Web Programming (3 cr.)**
P. A201 or equivalent. An introduction to programming web documents, including HTML, JavaScript and Perl. Creation of a simple web site, including a home page with dynamic elements, using both client-side and server-side techniques.

P. Prerequisite
R. Recommended

The basic admission requirements for students in this certificate program are the same as those used for admission to IU South Bend. Students have to apply and be admitted to IUSB, prior to pursuing this program. In addition, the College of Liberal Arts and Sciences requires all students who are pursuing a certificate program to removed all mathematics and English deficiencies (i.e. M014, W180) prior to receiving their certificates.
Students without deficiencies, can complete the certificate program in a minimum of three semesters.

<table>
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<tr>
<th>1st Semester</th>
<th>2nd Semester</th>
<th>3rd Semester</th>
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<tr>
<td>A106</td>
<td>A107</td>
<td>A338</td>
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<tr>
<td>A201</td>
<td>A150</td>
<td>A340</td>
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No more than 6 credits may be transferred from another institution.

III. Expected student outcomes

We expect students who complete this certificate program to be able to understand and effectively operate application software, develop custom-designed solutions based on existing off-the-shelf tools and applications, set goals, oversee the procurement and implementation of technology in an organization, assign tasks and interact with other technical personnel.

Students receiving this certificate may apply their skill in the design of custom software integration of off-the-shelf packages, design and implementation of databases, install and deploy computer networks, and application of standardized software to solve new or existing problems.

IV. Assessment of student outcomes

Given that this certificate is based on existing courses, the common methods of graded assignments and examinations are used to evaluate the students’ programming, analytical, and problem-solving capabilities. The department also will assess the success of its certificate holders by conducting surveys several years after the completion of the certificate. Where possible, we will survey the employers of certificate holders to help us determine whether certain topics should be given greater or less emphasis.
V. Student population to be served

The goal of this certificate is to provide the necessary technical expertise to those who currently hold positions that make extensive use of computer technology and its applications but feel a gap in their knowledge or those who are considering such positions in the future and need solid knowledge and expertise in the use and integration of computer applications. Potential students who may benefit from this certificate may be found in many organizations, including health care, science and engineering, government, and not-for-profit agencies. In addition, existing students at IU South Bend, may find this certificate complementary to their major. The table below provides a more detailed discussion of the categories of students who may be served by this certificate.

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<th>Benefits to On-Campus Students</th>
<th>Benefits to Off-Campus Students</th>
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<td>Students who wish to obtain computer application expertise, but not necessarily a minor or an associate of science in computer science.</td>
<td>Many employees in our region can be classified as &quot;Information Workers&quot; or &quot;Knowledge Workers&quot;, working in a variety of office or industrial settings. A significant number of these employees were not specifically trained for the skills necessary to be an effective &quot;Knowledge Worker&quot;. They feel a gap in their knowledge of concepts or the application of those concepts. This group includes a large segment of the work force, including secretarial staff, office managers, self-employed business owners, engineers, medical assistants and professional office clerks.</td>
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<td>A minor or an associate of science in computer science is made up of regular computer science courses in our program. These courses have a more elaborate and rigorous prerequisite structure. The courses designed for the Certificate in Computer Application are designed for non-majors and their prerequisite structure are not as deep.</td>
<td>The department also admits a number of students from Ivy Tech, and Purdue Technology programs. Most of the courses taken by these students do not transfer as regular computer science courses into our AS or BS programs. We expect that some students transferring from these institutions may transfer up to 6 credits into this new certificate program and then proceed to complete the certificate at IUSB.</td>
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VI. Relationship to campus and departmental mission

This program is directed toward attracting new students to IUSB, toward complementing existing majors, and toward providing education and skills immediately applicable in a variety of workplace settings in our region.

VII. Relationship to existing programs within Indiana University

Except for A338, which is being developed, all the courses required for this certificate are currently offered by our department at IUSB. The A338 courses offered by our department are designed for non-computer science majors and the general public. This certificate may enhance the enrollment in these courses, and therefore, reduce the possibility of their cancellation due to lack of enrollment. We expect that after finishing their certificate, some of the students may apply to the A.S. or B.S. degree programs in computer science, and therefore enhance the enrollment in those programs as well.

VIII. Resources required to implement the proposed program

Currently, there are sufficient full-time faculty to teach the courses necessary to support this certificate. Given that all except one of the courses needed for this certificate already exist in our curricula, we do not anticipate the need for additional faculty or other resources for developing this certificate. In addition, we do not anticipate any additional cost for software or library budget.

IX. Innovative features of the program

Our goal is to develop a highly applied certificate program that will integrate potential projects from local and regional companies. Faculty and students will be encouraged to solicit proposals from local and regional non-profit organizations. If suitable, these proposals will be integrated with course projects in A201 and A340.