

# DEPARTMENT REPORT OF PROGRAM LEARNING OUTCOMES ASSESSMENT

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Department: Computer Information Systems

Program (Degree): Computer Information Systems (CIS)

Type of Degree:  X  AAS      AA      AS      ATS      AIS

Chairperson: Nancy Thibeault                      Date: May, 2000

Person(s) Interviewed: Nancy Thibeault, Patty Santoianni, Carolyn Hannah, Tony Mann, Ken Melendez, Pete Maggiacomo

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- I. Program Curriculum:** A description of the basis for the program curriculum (i.e., how it is derived and validated). Include accreditation organizations, advisory committees or external groups that influence curriculum. Describe curriculum review activities including the review of course master syllabi.\*

Curriculum in the CIS program is constantly changing. Projecting for the future is critical for this department. During 1999-2000, the CIS department has been focused on developing and updating its curriculum. Input has come from a variety of sources. The department examines curriculum models from the Association of Computing Machinery (ACM), the Association of Information Technology Professionals (AITP) and the Northwest Center for Emerging Technology for national input. The state of Ohio has developed the IT-Works. model. This competency-based model was derived through a DACUM process using a panel of business, industry and labor in Ohio. Locally, the Information Technology (IT) Alliance, an offshoot of Miami Valley Coalition of Economic Development, provides guidance on the development of IT in the Miami Valley. Also, Tech Prep has a curriculum model for K-14 that is referred to by the department.

The proposed CIS curriculum consists of a core curriculum plus several options to complete the degree. The core was developed by using competency information from the sources above, alignment with OBOR specifications and Sinclair general education requirements, and student feedback from the CIS capstone course. The options to complete the degree include: software development/programming, Web programming/development, networks (MCSE or CISCO certified) and user support. One capstone course will be offered with projects adapted to fit the student's degree option. Approval for the new curriculum is expected to take place during fall of 2000.

The Computer Support Services degree offered by the department is being phased out as a separate degree and will become the network/user support

option in the proposed CIS degree curriculum. This decision was based on recognition of the development of different industry tracks for this area (networking, electronics, etc.). A review of the amount of electronics in the program was completed and those courses are being replaced by MCSE (Microsoft Certified Systems Engineer) certification courses and user support courses.

Tech Prep initiatives have expanded and now include Greene and Miami Valley Career Technology Centers, Centerville, Greenville, Kettering Fairmont, Dayton, Miamisburg, Northridge, Warren County Career Center, D. Russell Lee Career Center. The high schools provide introductory level courses in computer literacy, word processing database, spreadsheet, web development and networking introductory programming. Sinclair builds on that foundation on an individual basis and moves students into more advanced course work. Students who came in 1997 have stayed at Sinclair, have moved into the workplace or have transferred on to four-year institutions. Four to five additional high schools have developed IT programs during the 1999-2000 year. The proposed CIS core curriculum is aligned with high school curriculums.

The department was awarded a National Science Foundation (NSF) Grant in partnership with three other community colleges to improve and expand IT learning opportunities. The emphasis on curriculum development is being supported by this grant. Faculty began work on incorporating the NSF model for modular architecture into new courses during summer of 2000. Special emphasis is being placed on development of instructional materials to support part-time faculty. The grant will also support establishment of an IT Academy.

The IT-Alliance focus group helped to refine curriculum guidelines for a short-term certificate leading to "Fast Track", an industry retraining effort for experienced programmers. Two additional certificates have been developed to accompany the proposed degree revisions and are waiting approval: Web Authoring and Help Desk.

The department is working to update the Advisory Committee to align with the proposed curriculum changes and degree options. The Committee is being enlarged to include four-five representatives for each degree option, one or two from Tech Prep schools, and one or two from the Dayton New Horizons training center.

- II. **Program Learning Outcomes:** A description of what you intend for students to know (cognitive), think/feel (affective), or do (psychomotor), when they have completed your degree program. A suggested manageable number of outcomes should be in the range of five to ten. Describe Program Learning Outcomes review activities.\*

Program outcomes have not changed since the last program review although revisions may come in the future as the proposed degree options are put into place. There have been changes in the curriculum as a result of

elimination of prerequisites and new course numbers that have been assigned to replace CIS 297 (Special Topic) sections.

An entry-level graduate with an Associate of Applied Science Degree in Computer Information Systems from Sinclair Community College will be able to:

Learning Outcomes	Related Courses
1. Apply mathematical skills to formulate and solve problems manually (later to be solved by programming a computer).	MAT 116 or 121, 122
2. Identify and apply the principles of financial accounting.	ACC 111, 112, 113
3. Describe/apply general business knowledge and skills.	ECO 105 or 201; LAW 101; MAN 105; MAR 201
4. Exhibit professional/occupational behavior and work habits.	all CIS courses
5. Correctly design and program a computer solution using procedural and non-procedural methods, given detailed specifications of a problem.	CIS 110, 111; CIS language options
6. Apply program development techniques that demonstrate a formal process for decision making and problem solving.	CIS 110, 111, 210, 265, 299
7. Identify, analyze, and document program/system specifications and information requirements for a typical business problem.	CIS 110, 111, 210, 265
8. Demonstrate the ability to use software packages on a personal computer to prepare and manipulate word processing documents, design and use spreadsheets, create graphs, use databases and communicate with other PCs using telecommunication facilities available.	CIS 107, BIS 160, CIS 297 (Advanced MS Office)
9. Demonstrate the ability to design and implement personal and corporate databases using a commercial database package.	CIS 265

<b>Learning Outcomes</b>	<b>Related Courses</b>
10. Identify the basic, underlying procedures and relationships which are the components of a business computer system, including hardware, software, data, and people.	CIS 210, 225, 230, 265, 299
11. Work as part of a team to complete a system development project assignment.	CIS 265, 299

An entry-level graduate with an Associate of Applied Science Degree in Computer Information Systems, Computer Support Services from Sinclair Community College will be able to:

<b>Learning Outcomes</b>	<b>Related Courses</b>
1. Apply mathematical skills to formulate and solve problems manually (later to be solved by programming a computer).	MAT 103
2. Describe/apply general business knowledge and skills.	Business Electives
3. Exhibit professional/occupational behavior and work habits.	all CIS courses
4. Correctly design and program a computer solution using procedural and non-procedural methods, given detailed specifications of a problem.	CIS 111; CIS language options
5. Apply program development techniques that demonstrate a formal process for decision making and problem solving.	CIS 110, 111
6. Demonstrate the ability to use software packages on a personal computer to prepare and manipulate word processing documents, design and use spreadsheets, create graphs, use databases and communicate with other PCs using telecommunication facilities available.	BIS 160
7. Identify the basic, underlying procedures and relationships which are the components of a business computer system, including hardware, software, data, and people.	CIS 107, 225, 230

Learning Outcomes	Related Courses
8. Work as part of a team to complete a system development project assignment.	CIS 278
9. Install, configure, verify, and troubleshoot a network system.	CIS 278
10. Demonstrate the ability to repair circuit boards, and apply principles of DC and AC circuits, solid state devices, linear ICs, digital circuits, microprocessor programming to analyze electronic circuits and working of personal computers.	EER 123, 126, 127, 128, 136, 137, 138
11. Demonstrate the ability to troubleshoot and repair personal computers.	EET 264

III. **Assessment Method(s):** A measurable indicator of success in attaining the stated learning outcome(s). The methodology should be both reliable and valid. Please describe in detail.

- a. Formative Assessment Method(s) and Description: a measurable indicator of student in-progress success in attaining the stated learning outcome(s).

Formative assessment is achieved through course-by-course completion. CIS courses provide interactive learning experiences where students complete small projects. Tests and quizzes are also used to assess learning. Additional formative assessment methodologies are being developed as faculty “adopt and adapt” new courses using the NSF model modular architecture.

- b. Summative Assessment Method(s) and Description: a measurable indicator of end-of-program success in attaining the stated program learning outcome(s).

Summative assessment is conducted in CIS 299, Final Programming Project, the capstone course for this degree. CIS 299 is a four-hour course which focuses on a systems development project that the students design and complete. These projects have come from both inside and outside the college. Examples of past projects have included web pages, grants development projects, inventory and budget projects, database creation, and business plans. This course has been taught thus far by only one instructor, so consistently in approach has been possible. The instructor acts as the development manager, and user interviews are part of the early structure of the project. Collaboration and team dynamics play an important role in the success of the projects. The instructor also completes a transcript review for each student so that teams can pull from appropriate strengths and weaknesses of the students.

Another major part of CIS 299 is a career planning and placement component, including resume preparation, marketing, researching job opportunities, interviewing and students complete course and peer evaluation forms which are used to review the degree curriculum and the students' perceptions of their abilities. This data is shared with CIS faculty.

The spring of 2000 section of CIS 299 participated in a Sinclair Foundation supported Innovative Project with the General Education Committee to assess oral communication and thinking skills. Students were assessed by faculty and staff from various departments during the formal presentation of their projects. Students also provided written responses to questions about their general education experience at Sinclair.

Summative assessment for the Computer Support Services track is conducted in CIS 278 (Computer Support Services Capstone). This course has embedded within it preparation for A+ Certification (computer hardware repair certification). Students must work as part of a team to complete a system development project assignment. This includes installing, configuring, verifying, and troubleshooting a network system. Content for a portion of the course was guided by a local networking group. Project evaluation is based on technical competency, professional work habits, and behavioral work habits. A+ certification is the benchmark for hiring students in the workplace. More than 50% of the companies in the area require A+ certification. A+ Certification comes after the completion of CIS 278. Students are not required to either take or pass the examination as part of the course requirements.

**IV. Results:** A description of the actual results of overall student performance gathered from the summative assessment(s). (see III.b.)

The spring 2000 projects included three web page developments (Occupational Therapy Department, Business Counselors, and Computer Information Systems Department) and six database projects (Experienced Based Education Department, Physical Education Department, Emergency Medical Technician Department, Kettering Adult School, Manual Communications Department and the Dayton Christian Connection). Students are completing all projects and demonstrate competence in computer skills. Feedback from CIS 299 indicates that students' technical skills are very good. Areas needing emphasis include oral and written communication, time management, teamwork, and critical thinking. Students say that CIS 299 is the best course they ever took because it is "real."

Students provide feedback on the CIS curriculum as part of CIS 299. Their feedback indicates a need for development of soft skills, especially communication. They also say there needs to be more coursework on project planning and management.

In CIS 299, a survey is given to the project "user" to determine how well students perform and how well they are prepared. Technical skills are rated highly.

Assessment results for CIS 278, the capstone for the Computer Support Services Option, is limited. Sinclair is not an official site for the A+ Certification examination and little tracking is available since the testing occurs at independent test sites. The college doesn't have access to results of individual student's tests. The department has only anecdotal information on student success with the examination. Most students are getting certified in at least one area of the MCSE or A+.

- V. **Analysis/Actions:** From analysis of your summative assessment results, do you plan to or have you made any adjustments to your program learning outcomes, methodologies, curriculum, etc.? If yes, describe. If no, explain.

Results from CIS 299 were used for curriculum changes. The proposed core curriculum for CIS includes an additional communication course. Systems Analysis (CIS 210) is required for all degree options along with a module in project management software. Advisory board members concur with these changes.

A comprehensive curriculum review was the primary action for the CIS department in 1999-2000. For more information, refer to the section on curriculum in this report.

- VI. **General Education:** Are you using any tool(s) to assess any of the three primary general education outcomes\* (communication, thinking, values/citizenship)? If so, describe.

General education components are built into the program on a course-by-course basis. The master syllabus for CIS 110, Program Design and Logic, has been used as a model by other departments for incorporating general education learning outcomes for communication, thinking and values/citizenship/community into a course.

- a. Where within the major do you assess written communication? Describe the assessment method(s) used. Describe assessment results if available.

No information given.

- b. Where within the major do you assess oral communication? Describe the assessment method(s) used. Describe assessment results if available.

The oral communication checklist is used in the capstone course for assessment of the team project presentations. Use of the oral communication checklist is at the discretion of the individual faculty member.

Teamwork activities incorporating interpersonal communication is used by some CIS instructors.

- c. Where within the major do you assess thinking? Thinking might include inventing new problems, seeing relationships and/or implications, respecting other approaches, demonstrating clarity and/or integrity, or recognizing

assumptions. Describe the assessment method(s) used. Describe assessment results if available.

All CIS courses contribute significantly to the students' abilities to think logically within the computer information content areas.

- d. Where within the major do you assess values/citizenship/community? These activities might include behaviors, perspective, awareness, responsibility, teamwork, ethical/professional standards, service learning or community participation. Describe the assessment method(s) used. Describe assessment results if available.

Ethics is an important part of CIS 299, and includes an article review on ethical issues as they pertain to word processing. CIS 299 also requires that students attend meetings of professional organizations; this contributes to values

The CIS department also sponsors a student chapter of AITP, Association of Information Technology Professionals, where students learn about professional ethics.

- \* Note: The oral communication checklist and the written communication checklist developed by the General Education Committee were adopted for college-wide use during the 1997-98 academic year by Academic Council. Thinking Guidelines developed by the General Education Committee are being piloted by faculty during the 1998-99 academic year.