

**MOREHEAD STATE UNIVERSITY  
Program Review for  
Computer Science Endorsement 8-12**

**Department of Information Systems**

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**Morehead State University**  
**Computer Science Endorsement Grades 8-12**

**I. CONCEPTUAL FRAMEWORK**

**Unit Overview**

The general aim of the Professional Education unit at Morehead State University is to prepare educators who are able to perform effectively in school based settings. More specifically, graduates must demonstrate the knowledge, skills, and dispositions that are essential if they are to successfully fulfill the role of new or experienced teacher, school counselor, or administrator. The theoretical framework that undergirds the program is articulated in the unit's conceptual framework; the theme is "Educators as Architects: Designing Environments Where Students Construct Knowledge and Develop Skills."

The architect metaphor is used for three reasons:

- 1) It strikes a balance between the educator as key actor in the traditional classroom, and the educator as passive observer in the romanticized classroom. It also implies that the educator is central to the planning and preparation of classroom activities but the student is the active doer of the work of learning (Blythe, Allen, Schieffelin, 1997).
- 2) It suggests that educators are not merely the implementers of canned learning materials created by others. They are the artists, creating environments specific to the needs of their students, at a particular point in time, and using a variety of materials as appropriate (Tomlinson, Callahan, 1997).
- 3) Constructivist theory says that "learners construct their own knowledge by testing ideas and approaches based on their prior knowledge and experience, applying these to a new situation, and integrating the knowledge gained with pre-existing intellectual constructs" (Piaget, 1952).

Educators, therefore, are responsible for constructing authentic learning environments to engage students in activities that are inherently interesting and meaningful. Through the use of the "Educator as Architect" metaphor and its constructivist epistemology, the following themes and activities are expected to serve as building blocks and recur throughout the content and methodology of the educator preparation programs:

1. Engaging students in a comprehensive and multifaceted knowledge and skills base that can be applied and used in multiple contexts
2. Acknowledging the belief that learning is an active and on-going process (Piaget, 1952)
3. Providing students with direct experiences so that they can use and process information while seeking solutions (Piaget, 1969)
4. Placing students in authentic or "real" world settings so that learning has the potential to be meaningful (<http://www.coe.uh.edu/~9chen/ebook/EFITT/cognitive.htm>).
5. Encouraging students to extend their ability to process and learn from reflecting on their own experiences so that they can develop more informed and sophisticated teaching practices (professional development) (Dewey, 1959; Reiman, 1999)
6. Providing students with opportunities to understand the impact that dispositions, attitudes, values, and beliefs have on student learning and development (Richardson, 1966)
7. Assessing students and faculty by using a variety of quantitative and qualitative measures, including authentic performance-based projects and action-research (<http://curriculum.calstatela.edu/faculty/pssparks/theorists/501/consti.htm>).
8. Encouraging faculty and public school practitioners to fulfill the role of facilitators of learning by constructing experiences in environments that stimulate students and provide thought, action, and reflection (Richardson, 1999; Miller, Wilkes, Sheetham and Goodwin, 1993)
9. Assessing student abilities in and demonstrating an awareness of and ability to account for learner diversity, including gender, race, ethnicity, cultural, and exceptionality in all aspects of the educational setting (Darling-Hammond, 2000) Extending graduate's ability to

communicate effectively with students, parents, professionals, peers, and members of the community. The intention is to enhance the spirit of collaboration in an effort to evaluate and enhance the ability of the school to fulfill state and local educational objectives (Dewey, 1938/1959).

10. Preparing professionals and faculty who are able to effectively integrate technology into all aspects of the educational process in order to improve communication, teaching, learning, and assessment
11. Monitoring the extent to which each educator preparation and endorsement program fulfills its goals and commitment to preparing graduates to demonstrate performance standards, as well as the system each uses to produce positive change (NCATE, 2000)

The entire Morehead State University Conceptual Framework document is available on line at [www.msucoe.org](http://www.msucoe.org).

### **Program Links To the Unit's Conceptual Framework**

The Computer Science Endorsement 8-12 Program is linked in a number of ways to the conceptual framework and its theme "Educators as Architects: Designing Environments Where Students Construct Knowledge and Develop Skills." Information technology and computer science skills are in demand in the workplace. By preparing teachers to be on the cutting edge of technology, their students' futures are enhanced and a significant contribution is offered to the school-based curriculum. In addition, teachers are expected to "build" upon and demonstrate the skills and knowledge appropriate for a teacher of computer science, as defined in the Experienced Teacher Standards (ETS).

The Computer Science Endorsement 8-12 Program is designed to prepare practitioners who are equipped with communication and teaching skills and who desire a high level of technical competence and exposure to computer programming and systems development and implementation. The program is content intensive; therefore, teachers must be creative problem solvers, lifelong learners, and change agents in their school environments. To instill and reinforce these skills, reflecting, thinking, and learning opportunities provided by the course work must extend their classroom learning into their own school situations and on to their own students. The role of the teacher as learner is a powerful role model for students.

As students (teachers) progress through their content courses, they are exposed to a variety of assessment strategies. Teachers will be expected to build upon their experiences with assessment strategies. These strategies might include multiple choice, higher-order thinking, open response, problem solving and decision-making, scenario development, performance assessment, and other tools for use in their classrooms. Overriding strategies must include authentic, performance-based projects.

## **II. PROGRAM ASSESSMENT**

- A. Teacher certification in a Kentucky approved 8-12 program
- B. Successful completion of 18 semester hours in computer science content based on 12 hours of foundation courses (usually completed during the initial teacher preparation program in the General Education course work)
- C. Minimum GPA of 2.5 (documented by official transcript) and monitored by the program advisor
- D. On-going Program Assessment

A strong assessment program has been instituted by the university as a whole as suggested by SACS. In the College of Business, each program area has been required to develop, implement, and monitor its own assessment goals, with feedback from the college-wide evaluation committee. The following goals and strategies have been developed for monitoring and meeting the goals for the Computer Science Endorsement 8-12 Program.

- **Goal 1.** Students completing the Computer Science Endorsement 8-12 Program will be prepared to extend and enhance the initial teaching certificate.
  - **Means of Program Assessment & Criteria for Success:** The teacher will be eligible for the endorsement after the Computer Science Endorsement worksheet has been signed by the advisor, department chair, and the dean and forwarded to the MSU Certification Officer.
- **Goal 2.** Students will demonstrate effective skill development in computer science as demonstrated through the successful completion of the capstone course, CIS 490, IT Project Management and Senior Project.
  - **Means of Program Assessment & Criteria for Success:** Students will learn skills in information technology project management and will complete a capstone project in a real-world working environment. Working in teams, students analyze the project in a paced approach, identify and document metrics and milestones, and deliver an information systems solution under deadline that meets the agreed-upon project objectives. Final deliverables include a term portfolio and a formal class presentation.
  - **The project** will be evaluated by the instructor and a panel of IS faculty who attend the final project presentations and review the project portfolios.

### III. PROGRAM EXPERIENCES

In this section of the program review, several matrices will be presented to demonstrate program congruence with various elements, as follows:

- A) Program Coursework and Experienced Teacher Standards (see Matrix 1)
- B) ISTE National Educational Technology Standards (see Matrix 2)
- C) Computer Science Endorsement Coursework and the Learner Goals, Academic Expectations, 8-12 Program of Studies, and Core Content Assessment (see Matrix 3)
- D) EPSB Themes (see Matrix 4)

Complete syllabi for all courses in the 18-hour endorsement program may be found in Appendix A.

**A. Computer Science Program Course Work and Experienced Teacher Standards.** Matrix 1 illustrates the connections between the Computer Science Endorsement coursework and the Experienced Teacher Standards. The heart of the Computer Science Endorsement program is the required 18 hours of intense subject matter content.