A. Course Title: LIBM/MSTS 6357 Diagnostic Techniques for Computer Maintenance

B. Catalog Description:

LIBM 6357 provides the student with an opportunity to apply concepts, design criteria, general circuit theory, module installation, system configuration, and preventive maintenance of personal computers. Emphasis is placed upon techniques used by individuals who configure systems, set-up and maintain PCs and networks.

C. Purpose:

Understanding how personal computers work, how to use them, and how to keep them working have become essential skills for many professionals in technical and education occupations. Diagnostic Techniques for Computer Maintenance is designed to assist professionals in both technical and educational fields who need essential computer hardware knowledge and skills to install, maintain, upgrade, and optimize personal computers and computer networks.

D. Required Text:

Mueller, S. (2006). *Upgrading and repairing PCs* 17th edition. Indianapolis, IN: Que Publishing.

Belkin 36-Piece Premium Computer Tool Kit. ($33.50-$40.00 + Tax, S/H). CompUSA (www.compusa.com) or MicroWarehouse (www2.warehouse.com) Online stores.

E. Conceptual Framework: "Educators as Reflective Decision-Makers"

"EDUCATORS AS REFLECTIVE DECISION-MAKERS" Faculty members involved in the preparation of professional educators, as well as professional education candidates, public school representatives and members of the community share a vision for the Professional Education Unit at the University of Central Arkansas (UCA). This vision is one of preparing Educators as Reflective Decision-Makers. The vision encompasses the development of candidates' abilities to examine problems, formulate options, consider decisions, and evaluate out comes while embracing an awareness of and sensitivity to human diversity. The vision is achieved by candidates' acquisition of reflective decision-making skills through self-understanding, course work, and field and internship experiences.

How do the goals of the program reflect the conceptual framework?

The Master of Science in Library Media and Information Technologies prepares competent persons for professional positions in a variety of educational agencies. This program of study is designed for individuals who may be planning careers in school library media centers; at the elementary, secondary, and district levels; and at regional educational cooperatives. A common set of knowledge, dispositions, and attitudes has been delineated for candidates to possess and to enhance their skills as reflective decision makers. Degree candidates will obtain knowledge and awareness that many learners have special needs that must be met for maximized learning. They will be prepared to use technology for instructional purposes. Specific program evaluation procedures are outlined in the university approved "Assessment Procedures and Criteria" for Master of Science in Library Media and Information Technologies.

Master of Science in Educational Media/Library Science Goals

- Graduates will be able to:
    - Articulate a philosophy of library media services, which reflects an integration of principles of library science, educational media, and instructional design.
    - Design, implement, and market for specified client populations programs of services, which further the curriculum objectives of the school/district by integrating them into the total educational programming of the school/district.
    - Apply principles of management, including planning, to the operation of the school library media center.
    - Select and build a quality collection of resources and equipment that meets the educational objectives of the school/district, promotes intellectual freedom, and meets clients' needs and purposes.
    - Organize and maintain collections of resources and equipment for efficient use reflecting the application of the latest use of technologies.
    - Provide instructional opportunities, including bibliographic instruction, for various client populations as appropriate.
    - Use information technologies and networks to acquire and share information and for reference and referral services.
    - Analyze research data and use this information to assess and solve school library media related problems.
    - Work with other education professionals to address instructional and curricular problems, including those involved in establishing activities that enable the student to increasingly assume responsibilities for planning, understanding, and assessing their own learning, and to implement student learning activities reflecting different learning styles, and to ensure a variety of student learning environments.
    - Incorporate into programming the resource and service needs of all users (e.g., the culturally diverse, the exceptional populations, the disabled).
    - Recognize the importance of practicing effective leadership and interpersonal relationships within the educational, local, and professional communities.

How does this course address the conceptual framework and the overall program assessment?

In this course candidates address fundamental techniques and skills for managing and maintaining computer hardware. This course helps to develop higher order thinking through evaluation and diagnostic techniques, thus requiring reflective practice of the assessment of computer related needs and problems.

F. Use of Technology:

A basic function of the field of technology education is to enable students to develop sufficient technological literacy to work proficiently. As teachers in technology education, candidates are expected to not only teach with and about technology, but also to be technology users. In this course candidates will utilize many items including, email, the Internet, WebCT, an Office suite, PC computer tool kit, and PC hardware components. The focus of the course is computer repair and maintenance techniques. All course assignments will be fully integrated with computer hardware exploration.

G. Diversity:

Each candidate will be assigned the task of locating computer hardware and components which when used augments and/or enhances the learning experience for diverse individuals. Candidates will be required to do an in-depth report reflecting on hardware utilization in the classroom or workplace.

H. Objectives:

At the end of this course, the candidate will be able to

- Identify the major components found in the typical PC (personal computer).
- Disassemble and reassemble a PC and verify correct operation upon completion.
- Perform common preventive maintenance procedures to extend the life of a PC.
- Use visual and audio troubleshooting techniques to identify a malfunctioning component, module, or circuit board.
- Remove and install a diskette drive and a hard disk drive, properly formatting and configuring the drives.
- Backup and restore data.
- State the various I/O (Input/Output) standards used within and between computers and their peripherals, explaining their fundamental characteristics.
- Use jumpers, switches, and software to configure I/O addresses, interrupt request lines, and direct memory access channels for various circuits in a PC.

I. Course Outline:

- Computer Circuits Overview
- Central Processing Unit (CPU)
- Power Supplies and Power Protection
- Motherboard
- Memory
- Buses
- Controllers
- Preventive Maintenance
- Troubleshooting
- Malfunction Identification
- Random Access Components
- Hard Disk Data Protection
- Disk Boot Procedures
- Data Recovery
- Input Peripherals
- Visual Displays
- Printers and Plotters
- Input/Output Interfacing
- Data Communications

J. Field Experience Requirement: N/A

K. Course Evaluation:

- Two exams will be given: a Mid-term and a Final. Each examination is worth 100 points.
- A reflective analysis paper, written in APA format, discussing a hardware component which either enhances and/or augments the learning environment for a diverse learner

population. A brief (5-10 minutes) presentation of this paper will be expected. This paper is worth 75 points.

- Three lab assignments of the following five will be required: component/motherboard mapping, computer assembly and testing, .component/software upgrade and testing, specs and quotes research, and malfunction reporting. These lab assignments are worth 25 points apiece, totaling 75 points for all three.
- Grading Scale:

90-100	A
80-89	B
70-79	C
60-69	D
Below 60	F

L. Attendance Policy:

Candidates are expected to exhibit a high degree of professionalism as reflected in their speech, manner, and dress. Prompt and consistent attendance is an essential dimension of professional behavior. Candidates will be expected to attend all class meetings. Absences should occur only in the case of illness or emergencies. For unavoidable absences, proper notification is expected as well as plans to make-up the time and work. Candidates should note the university's drop date policy, which includes notifying the registrar's office. Make-up exams will be scheduled at the discretion of the instructor.

M. Student Handbook Policy:

Candidates are expected to follow the policies regarding academic dishonesty, sexual harassment, and academic issues as outlined in the *UCA Student Handbook*. Candidates should familiarize themselves with all policies listed in the *Handbook*.

UCA provides program accessibility and reasonable accommodation for persons defined as disabled under Section 504 of the Rehabilitation Act of 1973 or the Americans with Disabilities Act of 1990. Support Services are available, in order to arrange an individual assistance plan. Refer to the *UCA Student Handbook* for information regarding required documentation of disabilities and additional information on disability support services.

N. Bibliography:

Andrews, J. (2003). *A+ Guide to hardware: Managing, maintaining, and troubleshooting.* Boston, MA: Course Technology, Thomson Learning.

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American Psychological Association. (2001). *Publication Manual of the American Psychological Association.* (5th ed.). Washington, D.C: American Psychological Association.

Ballew, J. & Duntemann, J. (2004). *Degunking Windows*. Scottsdale, AZ: Paraglyph Press.

Colombo, L., McQuinn, C., & Columbo, L. (1996). *Fun with computer electronics*. New York: Andrews & McMeel.

DiGiacomo, J. (1990). *Digital bus handbook.* New York: McGraw-Hill.

Gilster, R. (2003). *PC Repair bench book*. Indianapolis, IN: Wiley Publishing, Inc.

Kersey, R. (1994). *Personal computer operation and troubleshooting.* Englewood cliffs, NJ: Prentice Hall, Inc.

Lever-Duffy, J., McDonald, J., & Mizell, A. (2003). *Teaching and learning with technology.* Boston: Pearson Publishing.

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Palmer, M., Walters, M., & Badgett, T. (2002). *Guide to operating systems* (2nd ed.). Cambridge, MA: Thomson Learning.

Saxton, C. (2001). *Enhanced A+ lab manual for guide to managing and maintaining your PC*. (Enhanced 3rd ed.). Boston, MA: Course Technology, Thomson Learning.

Sharp, V. (2002). *Computer education for teachers: Integrating technology into classroom teaching.* (4th ed.). Boston: McGraw-Hill.

White, R. (2001). *How computers work*. Cambridge, MA: Que.

Young, R. (2002). *How computers work.* New York: 1stBooks Library.