

# **University of Arkansas - Monticello**



## **Division of Computer Information Systems**

### **Curriculum Courses:**

### **Objectives and Minimum Content**

**Prepared by the Faculty of the Division of Computer Information Systems**

**Adopted: Fall 2003  
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**Curriculum Courses:  
Objectives and Minimum Content**

**Table of Contents**

CIS 1013	Introduction to Computer-Based Systems	1
CIS 198V	Special Topics (Example 1)	3
CIS 198V	Special Topics (Example 2)	4
CIS 2193	PC Hardware and Software Maintenance	5
CIS 2203	Programming Logic and Design	7
CIS 2223	Microcomputer Applications	9
CIS 3103	Advanced Microcomputer Applications	11
CIS 3233	Business Database Management Systems	13
CIS 3243	Introduction to Java Programming	15
CIS 3423	COBOL	17
CIS 3433	Introduction to C# Programming	19
CIS 3443	Object-Oriented Programming Languages	21
CIS 3453	World Wide Web Programming	23
CIS 3523	Structured System Analysis and Design	25
CIS 3553	Advanced COBOL	27
CIS 370V	Computer Information Systems Practicum (Example 1)	29
CIS 370V	Computer Information Systems Practicum (Example 2)	30
CIS 398V	Special Topics	31
CIS 4253	CIS Security	33
CIS 4263	Ethics in Information Technology	35
CIS 4503	Business Data Communications	37
CIS 460V	Internship in Computer Information Systems	39
CIS 4623	Database Management Systems	41
CIS 4633	Application Software Development Project	43
CIS 4723	Seminar in Computer Information Systems (Example 1)	45
CIS 4723	Seminar in Computer Information Systems (Example 2)	46
CIS 479V	Independent Study in Computer Information Systems (Example 1)	47
CIS 479V	Independent Study in Computer Information Systems (Example 2)	49
CIS 589V	Special Topics in Computer Information Systems	51

University of Arkansas - Monticello  
Division of Computer Information Systems

2008

## Course Prerequisites

Course Name		Prerequisites
CIS 1013	Intro to Computer-Based Systems	None
CIS 2193	PC Hardware and Software Maintenance	None
CIS 2203	Programming Design and Logic	None
CIS 2223	Microcomputer Applications	Keyboarding ability
CIS 3103	Advanced Microcomputer Apps	CIS 2223
CIS 3233	Business DBMS	GE Math, Min of "C" in CIS 2223
CIS 3243	Intro to Java Programming	GE Math, Min of "C" in CIS 2203
CIS 3423	COBOL	Concurrent enrollment in GE Math, Min of "C" in CIS 2203
CIS 3433	Intro to C# Programming	GE Math, Min of "C" in CIS 2203
CIS 3443	Object-Oriented Programming	Concurrent enrollment in GE Math, Min of "C" in CIS 2203
CIS 3453	WWW Programming	None
CIS 3523	Structured Sys Anal and Design	GE Math, CIS 3423 or CIS 3443
CIS 3553	Advanced COBOL	Min of "C" in CIS 3423
CIS 370V	Practicum in CIS	Min of 12 hours of CIS Courses
CIS 4263	Ethics in Information Technology	CIS 3523 or Permission of Instr
CIS 4253	CIS Security	Min of "C" in CIS 3523
CIS 4503	Business Data Communications	CIS 3423 or CIS 3443
CIS 460V	Internship in CIS	Advanced Standing (70+ hours)
CIS 4623	Database Management Systems	CIS 3423 and CIS 3443
CIS 4633	App Software Development Project	CIS 3523 and CIS 4623
CIS 4723	Seminar in CIS	None
CIS 479V	Independent Study in CIS	60 hours, 12 hours & 3.0 in CIS

### Business Course Prerequisites

Course Name		Prerequisites
ACCT 2213	Principles of Accounting I	None
ACCT 2223	Principles of Accounting II	ACCT 2213
ECON 2213	Principles of Microeconomics	None
GB 2113	Business Statistics I	Gen Ed Math
MGMT 3473	Prin. of Management/Org Behavior	None
MGMT 4613	Management Information Systems	None
MKT 3403	Principles of Marketing	Econ 2213

### English Course Prerequisites

Course Name		Prerequisites
ENGL 3253	Technical Writing	Engl 1023

### Speech Course Prerequisites

Course Name		Prerequisites
SPCH 3483	Communication in Small Groups	None
SPCH 3533	Communication in Organizations	None

## Course Prerequisites

Course Name		Prerequisites
CIS 1013	Intro to Computer-Based Systems	None
CIS 2193	PC Hardware and Software Maintenance	CIS 1013 and CIS 2223
CIS 2203	Programming Design and Logic	None
CIS 2223	Microcomputer Applications	Keyboarding ability
CIS 3103	Advanced Microcomputer Apps	CIS 2223
CIS 3233	Business DBMS	GE Math, Min of "C" in CIS 2223
CIS 3243	Intro to Java Programming	GE Math, Min of "C" in CIS 2203
CIS 3423	COBOL	GE Math, Min of "C" in CIS 2203
CIS 3433	Intro to C# Programming	GE Math, Min of "C" in CIS 2203
CIS 3443	Object-Oriented Programming	GE Math, Min of "C" in CIS 2203
CIS 3453	WWW Programming	None
CIS 3523	Structured Sys Anal and Design	CIS 3423 or CIS 3443
CIS 3553	Advanced COBOL	Min of "C" in CIS 3423
CIS 370V	Practicum in CIS	Min of 12 hours of CIS Courses
CIS 4253	CIS Security	Min of "C" in CIS 3523
CIS 4503	Business Data Communications	CIS 3423 or CIS 3443
CIS 460V	Internship in CIS	Advanced Standing (70+ hours)
CIS 4623	Database Management Systems	CIS 3423 and CIS 3443
CIS 4633	App Software Development Project	CIS 3523 and CIS 4623
CIS 4723	Seminar in CIS	None
CIS 479V	Independent Study in CIS	60 hours, 12 hours & 3.0 in CIS

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Course Name		Prerequisites
SPCH 3483	Communication in Small Groups	None
SPCH 3533	Communication in Organizations	None

## Course Prerequisites

Course Name	Prerequisites	
CIS 1013	Intro to Computer-Based Systems	None
CIS 2203	Programming Microcomputer Systems	None
CIS 2223	Microcomputer Applications	Keyboarding ability
CIS 3103	Advanced Microcomputer Apps	CIS 2223
CIS 3423	COBOL	Gen Ed Math and CIS 2203
CIS 3443	Object-Oriented Programming	Gen Ed Math and CIS 2203
CIS 3523	Structured Sys Anal and Design	CIS 3423 or CIS 3443
CIS 3553	Advanced COBOL	CIS 3423
CIS 370V	Practicum in CIS	Min of 12 hours of CIS Courses
CIS 4503	Business Data Communications	Senior Standing (90+), CIS 3523
CIS 460V	Internship in CIS	Advanced Standing (70+ hours)
CIS 4623	Database Management Systems	CIS 3423 and CIS3443
CIS 4633	App Software Development Project	CIS 3523 and CIS 4623
CIS 4723	Seminar in CIS	None
CIS 479V	Independent Study in CIS	60 hours, 12 hours & 3.0 in CIS

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Course Name	Prerequisites	
ACCT 2213	Principles of Accounting I	None
ACCT 2223	Principles of Accounting II	ACCT 2213
ECON 2213	Principles of Microeconomics	None
GB 3713	Business Statistics	Gen Ed Math
MGMT 3473	Prin. of Management/Org Behavior	None
MGMT 4613	Management Information Systems	None
MKT 3403	Principles of Marketing	Econ 2213

### English Course Prerequisites

Course Name	Prerequisites	
ENGL 3253	Technical Writing	Engl 1023

### Speech Course Prerequisites

Course Name	Prerequisites	
SPCH 3483	Communication in Small Groups	None
SPCH 3533	Communication in Organizations	None

# **CIS 1013 Introduction to Computer-Based Systems**

## **Catalog Description**

3 credits: 3 hours lecture

An introduction to computers in business and scientific data processing. Overview of computer systems, computer languages, and data representation.

Offered: Fall, Spring, Summer

## **Course Objectives**

This course is intended to prepare students for hands-on computer courses. Students who successfully complete this course will have mastered the following objectives:

1. Demonstrate knowledge of the fundamentals of computers
2. Understand the basics of personal computer hardware and software and how the two work together
3. Be able to provide a brief history of computing, of current trends in society, and of potential uses in the future
4. Be able to discuss specific topics, such as security, privacy, systems development, networks, e-commerce, and careers in computing.

## **Course Content**

How the Internet Works

Types of Application Software

Internal Components of a Computer

Input Devices

Output Devices

Storage Devices

Operating systems and Utilities

Communications and Networks

E-Commerce

Security and Privacy

Databases

Information Systems Development

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## **CIS 198V Special Topics**

### **Course Description**

Variable Credit (1-3 hours)

Detailed study of one of the specialized areas of computer management, emphasizing basic knowledge and skills application.

Offered: As required

### **Example: One Hour Credit Course on Using WebCT**

#### **Course Objectives**

The student who successfully completes this course will be able to demonstrate knowledge of the WebCT software program.

#### **Course Content**

Creating/logging onto an account

Accessing icons from the homepage

Using the Calendar and Grades icons

Communicating with the class and instructor via Communications Tools

Turning in and reviewing Assignments



## **CIS 198V Special Topics**

### **Course Description**

Variable Credit (1-3 hours)

Detailed study of one of the specialized areas of computer management, emphasizing basic knowledge and skills application.

Offered: As required

### **Example: One Hour Credit Course on File Management**

#### **Course Objectives**

The student who successfully completes this course will demonstrate computer file organization, file management, and file manipulation.

#### **Course Content**

Use "My Computer" or "Explorer" from Microsoft Windows to manage computer resources

Root directories

Drive letters for various storage devices

Effective folder hierarchies

Create, move, copy, rename, and delete files and folders

Manipulate files, file formats, and file extensions

Create and extract compressed (zipped) folders

Search utilities to locate specific files

Identify free and used space on storage devices,

Recognize graphic, audio, and video file formats

Create file backups

## **CIS 2193 PC Hardware and Software Maintenance**

### **Course Description**

3 credits: 3 hours lecture

An introduction to computer maintenance, emphasizing hardware and software management, system maintenance, and troubleshooting in the PC environment.

Offered: Fall, Spring

### **Course Objective:**

This course is intended to provide students with hands-on computer maintenance skills.

Students who successfully complete this course will have mastered the following objectives:

1. Demonstrate knowledge of operating system fundamentals
2. Demonstrate knowledge of hardware and software installation, configuration, and upgrading
3. Utilize appropriate procedures for diagnosing and troubleshooting hardware and software problems
4. Demonstrate knowledge of preventative maintenance, safety and environmental issues
5. Demonstrate knowledge of motherboard, processor, and memory characteristics
6. Demonstrate knowledge of system peripherals.

### **Course Content**

#### Operating System Fundamentals

- Desktop Components and Interfaces
- Characteristics of different Operating systems
- Major File Systems
- Command Line Functions and Utilities
- Managing Disks, Directories, and Files
- Operating System Utility Programs

#### Installation, Configuration, and Upgrading

##### Software

- Installing Operating Systems
- Operating System Upgrades
- Basic System Boot Sequences
- Creating Emergency Boot Disks
- Procedures for Loading Software and Device Drivers
- System Tuning and Optimization

##### Hardware

- Characteristics of System Components
- Procedures for Replacing Components
- IRQ, DMA, and I/O Addresses
- Standardized Peripheral Ports
- Installing and Configuring IDE and SCSI Devices
- Installing and configuring Peripheral Devices
- Hardware Upgrading Considerations

#### Diagnosing and Troubleshooting

##### Software

- Recognize and Interpret Common Error Codes and Start Up Messages

Using Common diagnostic and Utility Tools  
Operational and Usability Problems

Hardware

Common Problems Associated with Components  
Isolating and Troubleshooting Problems  
Troubleshooting Procedures and Tools

Preventative Maintenance, Safety, and Environmental Issues

Preventative Maintenance Measures, Products, and Procedures  
Safety Measures and Procedures  
Environmental Protection Measures and Procedures

Motherboard, Processor, and Memory Characteristics

CPU Chip Characteristics  
RAM form Factors and Operational Characteristics  
Types of Motherboards and Architecture  
Purpose and Use of CMOS and BIOS

System Peripherals

Printers  
USB Bus Components  
Network Connections

## **CIS 2203 Programming Logic and Design**

### **Course Description**

3 credits: 3 hours lecture

Emphasis on fundamental problem solving, programming logic, and algorithm specifications using various modeling tools; coding of algorithms applicable to high level programming languages.

Offered: Fall, Spring, Summer

### **Course Objective:**

The student who successfully completes this course will:

1. Demonstrate an in-depth knowledge of developing structured programming logic techniques
2. Demonstrate the ability to analyze problems
3. Display their ability to create logical sequences using hierarchy charts and program flowcharts
4. Exhibit their ability to construct printer/monitor spacing charts for report writing
5. Code the problems using concepts taught in class/ text using psuedocode to display their ability to logically solve word problems.

### **Course Content**

Overview of computers and logic

Understanding structure

Modules, hierarchy charts, and documentation

Designing and writing a complete program

Making decisions

Looping

Control breaks

Arrays

Advanced array manipulation

Using menus and validating input

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## **CIS 2223 Microcomputer Applications**

### **Course Description**

3 credits: 3 hours lecture

*Prerequisite: Keyboarding ability recommended.*

The study and use of microcomputer-based applications software to increase business and personal productivity. Realistic computing problems will be solved using standard software packages.

Offered: Fall, Spring, Summer

### **Course Objectives**

The student who successfully completes this course will be able to demonstrate knowledge of the:

1. Windows Operating System
2. Word word-processing application
3. Excel spreadsheet application
4. PowerPoint presentation application
5. Internet connection applications and the World Wide Web.

### **Course Content**

Microsoft Windows Desktop and Components

- Using multiple storage devices
- Manipulating files and folders
- Changing mouse and desktop settings

Microsoft Word word-processing application

- Creating/saving documents
- Formatting fonts, margins, tabs, and bullets
- Adding headers and footers
- Use of smart tags and auto-complete
- Creating tables
- Printing documents

Microsoft Excel spreadsheet application

- Creating financial reports/income statements
- Navigating a workbook, selection, and movement techniques
- Using formulas/functions
- Formatting worksheets
- Creating charts and graphs

Microsoft PowerPoint presentations application

- Creating slide shows
- Editing slide information
- Modifying backgrounds and layouts
- Adding speaker notes

- Effective use of slide masters
- Inserting objects onto slides
- Adding animation to objects

Internet connection applications and the World Wide Web

- Exploring the history
- Using search engines
- Learning e-mail and Campus Connect

## **CIS 3103 Advanced Microcomputer Applications**

### **Course Description:**

3 credits, 3 hours lecture

*Prerequisite: CIS2223*

The advanced study, use, and integration of microcomputer-based applications software to increase business and personal productivity.

Offered: Fall, Spring, Summer

### **Course Objectives:**

The student who successfully completes this course will be able to demonstrate a more advanced knowledge of

1. Word – word processing application
2. Excel – spreadsheet application
3. PowerPoint – presentation application
4. Internet connection applications
5. Access – database application.

### **Course Content:**

Microsoft Word word-processing application

WordArt  
Columns  
Text Boxes  
Graphics  
Tables  
Mail Merge  
Web Pages

Microsoft Excel spreadsheet application

Solver  
Templates  
Scenarios  
Data Tables  
Macros  
Forms  
Lists  
Web Pages

Microsoft PowerPoint presentation application

Graphics  
Animation  
Tables



Kiosk Presentations  
Web Pages

Microsoft Access database management application  
Creation  
Modification  
Forms  
Filters  
Queries  
Reports

# CIS 3233 Business Database Management Systems

## Course Description

3 credits: 3 hours lecture

*Prerequisites: General Education Mathematics, Grade of "C" or better in CIS 2223*

Offered: Fall

Essentials of database design, creation and manipulation for business and accounting applications using a microcomputer-based package. Emphasis on advanced queries, reports and macros.

## Course Objectives

The student who successfully completes this course will:

1. Understand how databases are designed, created and maintained
2. Develop practical business and accounting applications using a popular microcomputer-based DBMS
3. Coordinate a project in an integrated group environment
4. Become acquainted with advanced techniques and database models from industry

## Course Content

### Introduction

- What is a DBMS?
- Why use databases
- Relational databases and concept of tables
- Records (rows) in a table
- Fields (columns/attributes) in a table
- Primary Key concept and unique identifier
- Foreign Key concept
- What is a query

### Creating database table objects

- Building and modifying the table structures
- Adding and deleting records
- Changing contents of records

### Creating and Running Queries

- Setting Criteria
- Sorting results
- Calculating new fields
- Calculating simple statistics
- Saving queries

### Maintaining a database

- Searching
- Changing data
- Deleting data
- Validating data
- Specifying Referential Integrity

- Sharing data
  - Converting data
  - Copying data
  - Exporting and Importing data

- Working with other Objects
  - Forms
  - Reports
  - Customizing objects
  - Using multiple table information

- Enhancing Forms
  - OLE fields
  - Hyperlinks
  - Subforms

- Creating Switchboards
  - Creating and using Macros
  - Creating and modifying switchboard pages
  - Automatically opening switchboards
  - Building executables

- Selected Web Features
  - Data Access Pages

- Using VBA and creating multi-page forms

- SQL Feature

- DBMS Administration

## CIS 3423 COBOL

### Course Description

3 credits: 3 hours lecture

*Prerequisites: Concurrent Enrollment in General Education Mathematics, Grade of "C" or better in CIS 2203*

Techniques essential to problem-solving with the COBOL programming language. Practical application with emphasis on structured approach.

Offered: Fall, Spring

### Course Objectives

The student who successfully completes this course will:

1. Demonstrate an in-depth knowledge of proper structured software development techniques, and competence in their application using the COBOL language
2. Utilize both batch and interactive processing environments. An emphasis on batch file maintenance activities will be demonstrated generating code on mainframes, minis, and microcomputers by means of the COBOL compiler
3. Utilize the DEC system to: 1) compile, link, execute, and 2) use of editorial commands to copy, move and delete statements
4. Exhibit their ability to construct structure charts, printer/monitor spacing charts for report writing
5. Code the applications using concepts taught in class/text, and properly document solutions to facilitate future maintenance.

### Course Content

Utilize the DEC system through DCL commands

Compile, run and execute programs

Send output to various printers

Know how to select, copy, move and delete text

Design structure charts

Understand the use of the four divisions

Use of COBOL standards for naming files, records, fields, and procedure names

Design input and output records

Understand the use of in-line and out-of-line PERFORMS

Use of READ AT END / NOT AT END statement

Use of various COBOL statements in the PROCEDURE division

Know how to improve appearance of computer output using numeric edited fields, RIGHT

JUSTIFIED, BLANK WHEN ZERO

Understand and use the REDEFINES clause

Use of arithmetic statements

Use of module-numbering conventions and independence of modules

Use of page-control features

Use of the INITIALIZE, SET, and ACCEPT/ FROM DATE statements

Use of conditional statements, IF, combined conditions, and EVALUATE statements

- Class conditions

- Programmer-defined class conditions

- Sign condition

- Condition-name conditions

- The SET command with Condition-names

- The use of POSITIVE and NEGATIVE

## **CIS 3243 Introduction to C# Programming**

### **Course Description**

3 credits: 3 hours lecture

*Prerequisites: General Education Mathematics, Grade of "C" or better in CIS 2203*

Offered: Fall

Design and development of intermediate Windows forms-based application using a task-driven approach with a C-based language.

### **Course Objectives**

The student who successfully completes this course will:

1. Understand the basic concepts of problem solving and programming/ program logic within a specific development environment
2. Understand event-driven applications
3. Build graphical interfaces
4. Create maintainable program applications

### **Course Content**

#### Introduction

History of Object-Oriented languages

Characteristics of OOP:

Encapsulation, Polymorphism, and Inheritance

Why use C#?

Definition of Classes

Definition of Objects

Instantiation

Associated Properties

The .NET Framework Class Library

Analysis and Logical Design of programming problems

Visual Studio.NET Environment

Creating an interface (Form)

Essential controls and properties

Writing and Testing Source Code

Initialization

Event Methods

Input concepts

Usage of Assignment Statements

Calculations and Arithmetic operators

Displaying results on a Form

Internal Data Representations

Variables and Identifiers

Data Types

Constants

## Data Manipulation

- Arithmetic operations
- String operations
- Using the Math Class

## Program Flow and Decision Making

- Conditional statements
- Data validation strategies
- Robust data validation
- Data type checking
- Range checking
- Displaying messages

## Catching Exceptions

- Types of errors
- Syntax for Exception Handles
- Throwing a Exception

## Methods

## Loops

- ListBox controls and their usage
- While/For/Foreach loops
- Loops with compound and complex conditions

## Arrays

- Usage
- Single dimensional arrays
- Sorting Array Lists
- Multidimensional arrays

## OOP Characteristics

## More User Interface Objects

- Advanced controls, properties, methods and other objects

## Database Connectivity

- A simple example using ADO.NET

## CIS 3243 Introduction to Java Programming

### Course Description:

3 credits: 3 hours lecture

*Pre-requisites: General Education Mathematics, Grade of "C" or better in CIS 2203*

Introductory study of the Java Programming language, emphasizing assigned readings, individual research and hands-on programming of Object Oriented programs using Java classes and Swing components.

Offered: Spring

### Course Objectives

The student who successfully completes the course will:

1. Demonstrate ability to code, debug and compile Java programs.
2. Demonstrate ability to describe the development of Object Oriented programming.
3. Demonstrate ability to create and use Java applets and stand-alone console programs.
4. Demonstrate ability to use Java Swing components to create GUIs.
5. Demonstrate ability to use Java programming syntax and good coding practices and techniques.
6. Demonstrate ability to use JDBC to access data from a relational database.

### Course Content

History of Java

What Java is and is not, and why it is so different.

Syntax of Java and good coding habits

Objects and Primitive data

What are objects:

Using objects, sting literals, variables and assignment

Primitive data types and expressions, arithmetic expressions

Creating objects, using libraries and packages

Invoking class methods and formatting output

Program Statements

Program development, control flow, if statement, Boolean expressions, operators

Do, While, For statements

Comparison of loops

Writing classes

Anatomy of classes and methods

Method of overloading and decomposition

Object relationships

Enhancing Classes

Null reference, this reference, aliases

Static Modifiers

Wrapper classes, nested classes

Interfaces and dialog boxes



## Arrays

- Indexing, declaring and using
- Arrays of objects
- Sorting
- Two dimensional arrays

## Inheritance

- Creating subclasses
- Overriding methods
- Class hierarchies
- Indirect use of class members
- Polymorphism

## Exception and I/O Streams

- Exceptions
  - Exception messages
  - Try statement
  - Finally clause
  - Checked and Unchecked exceptions
- Input/Output Streams
- Standard I/O
- Object serialization
- Files and GUIs
- Animations

## Graphical User Interfaces

- Preliminaries
  - GUI review
  - GUI design
- Layout managers
- Containment hierarchies
- Additional Features and components
  - Borders, Scroll panes, Lists, Combo Boxes, Text boxes

## JDBC Database connectivity

# CIS 3443 Object-Oriented Programming Languages

## Course Description

3 credits: 3 hours lecture

*Prerequisite: Concurrent enrollment in General Education Mathematics, Grade of "C" or better in CIS 2203*

Provides the student with theory and application of information systems development utilizing object-oriented (OO) technology. Topics include: analysis, design, data modeling, database management systems, and programming.

Offered: Fall, Spring, Summer

## Course Objectives

The student who successfully completes this course will:

1. Understand the basic concepts of programming, problem solving, and programming logic
2. Explain the design techniques of an event-driven language
3. Program visual interfaces
4. Create projects with loops, decisions, and data management.

## Course Content

### Introduction

Windows GUI and Object-oriented language  
Three step process and VB environment  
Printouts  
Errors and Help

### Controls

Text boxes, frames, check boxes, option buttons  
Multiple controls  
Designing for user convenience  
Coding controls

### Variables, Constants, & Calculations

Data (Variables & constants)  
Calculations  
Var function  
Arithmetic operations  
Formatting data  
Sums

### Decisions & Conditions

If statements  
Conditions  
Nested If statements  
Using If statements with option buttons and checkboxes  
Message boxes

- Input validation
- Calling event procedures
- Debugging

#### Menus, Sub Procedures, & Sub Functions

- Menus
- Dialog boxes
- Writing general procedures

#### Multiple forms

- Creating forms and Standard code modules
- Variables & constants in form projects
- About boxes and Splash Screens
- Using sub main for startup

#### Lists, Loops, & Printing

- List boxes and combo boxes
- Do/loops and For/next loops
- Using the MsgBox function
- Using string functions

#### Arrays

- Initializing
- Subscripts
- Use within a loop structure
- LIST box controls

#### Creating Object-Oriented Programs

##### Data Files

- File organization and Sequential file organization
- Trapping program errors and Err object
- Random data files
- Using a list box to store a key field
- Navigating through a random file
- Using OOP for file handling
- Updating a random file

#### Grids, Validation, Selection, and Sorting

# CIS 3453 World Wide Web Programming

## Course Description

3 credits: 3 hours lecture

Techniques essential to the design and construction of World Wide Web documents using Web programming languages and Web construction applications.

Offered: Fall, Spring

## Course Objectives

The student who successfully completes this course will:

1. Demonstrate knowledge of WWW site design
2. Demonstrate knowledge of web standards and accessibility standards
3. Demonstrate in-depth knowledge of XHTML and CSS programming
4. Exhibit the ability to manipulate text and graphics formatting, and
5. Create databases and extract and insert information using web forms.

## Course Content

Programming with Web Standards

Integrating Section 508 Accessibility standards

Validating XHTML and CSS Files

XHTML and CSS programming for:

- Structuring text
- Graphics and hyperlinks
- Creating the Box Model
- The Document Object Model and scripting
- Lists
- Tables
- Forms

Understanding of text and graphics formatting, including:

- Scanning hardcopy documents
- Creating and using Adobe Acrobat documents
- Creating graphics files
- Changing graphic file formatting
- Editing graphic files
- Constructing animated graphic files
- Creating banner graphics

Programming Javascript

- Manipulating page loading
- Creating information and dialog boxes
- Creating slideshows
- Creating security logins

Programming special effects

- Navigation bars

Splash screens  
Adding media  
Creating special text effects

Creating Databases  
Extracting data with web pages  
Inserting data with web pages

# CIS 3523 Structured System Analysis and Design

## Catalog Course Description

3 credits: 3 hours lecture

*Prerequisites: General Education Mathematics, CIS 3423 or CIS3443*

Application of skills and concepts developed in basic data processing course work to more advanced topics involving design, implementation, evaluation, and documentation of management information systems.

Offered: Fall, Spring

## Course Objectives

The student who successfully completes this course will have the knowledge to:

1. Demonstrate the importance of good information system analysis and design
2. Provide the definitions, concepts, and techniques necessary to obtain effective system development results
3. Demonstrate higher-level communication skills.

## Course Content

Players in the Systems Game

Preparing for a career as a systems analyst

Personality test

Cover letter

Resume

Personal presentation

Information System Building Blocks

Information Systems Development

Project Management

Gantt chart using Microsoft Project

Systems Analysis

Group manual and computer presentation over analysis elements

Requirements Discovery

Questionnaire

Data Modeling and Analysis

Data model using Microsoft Visio (all modeling uses this software pkg.)

Process Modeling

Context data flow diagram and functional decomposition diagram

Object-Oriented Analysis and Modeling

Use case model and actor list

Feasibility Analysis

Feasibility analysis matrix

Systems Design

Request for Proposal

Group manual and computer presentation over design elements

Database Design

Database design in 3<sup>rd</sup> Normal Form

Output Design and Prototyping

Redesign existing report

Design new report

Input Design and Prototyping Design source document User Interface Design

Design input screen

Systems Construction and Implementation

Create test plan

Systems Operations and Support

Etiquette

RSVP

Lunch

Student Evaluations

Evaluate other students' presentation and group skills

## **CIS 3553 Advanced COBOL**

### **Course Description**

3 credits: 3 hours lecture

*Prerequisite: Grade of "C" or better in CIS 3423*

Emphasis on structured methodology of program design, development, testing, implementation, and documentation of business-oriented applications. Includes coverage of sequential and random access files and processing techniques, and development of programs and systems of programs for batch and interactive environments using COBOL programming language.

Offered: Fall, Spring

### **Course Objectives**

The student who successfully completes this course will:

1. Demonstrate an in-depth knowledge of proper structured software development techniques, and competence in their application using the COBOL language
2. Utilize both batch and interactive processing environments. An emphasis on batch file maintenance activities will be demonstrated generating code on mainframes, minis, and microcomputers by means of the COBOL compiler
3. Utilize the DEC system to: 1) compile, link, execute, and 2) use of editorial commands to copy, move and delete statements
4. Exhibit their ability to construct structure charts, printer/ monitor spacing charts for report writing
5. Code the applications using concepts taught in class/ text, and properly document solutions to facilitate future maintenance
6. Demonstrate their ability to work within a group.

### **Course Content**

Utilize the DEC system through DCL commands

Compile, run and execute programs

Send output to various printers

Know how to select, copy, move and delete text

Design structure charts

Design and write multi-level control break programs

Write programs that validate data using the following:

Class, sign, presence, absence, range, limit, reasonableness, consistency, justification, and embedded-blank test

INSPECT/REPLACING statement

INSPECT/TALLYING statement



Processing arrays/tables using:  
PERFORM/VARYING option  
loading arrays (hard-coded vs. data file loading)  
Using indexes vs. subscripts  
Using the serial search vs. binary search

Utilizing Sorting Concepts  
DUPLICATES phrase  
Collating sequence and designating that sequence  
RELEASE/ RETURN statements  
The various preprocessing/postprocessing methods  
MERGE statements

Sequential Master-Transaction File processing

Indexed file processing both batch and interactive modes

## CIS 370V Computer Information Systems Practicum

### Course Description

Variable credit

*Prerequisite: Completed 12 hours in Computer Information Systems or permission of unit head*

**NOTE:** May be repeated for a total of 6 hours credit with approval of the unit head.

Introduction to research and specialized programming in computer information systems in the context of assisting with faculty research and programming projects.

Offered: As required

**Example: Assist in developing a curriculum for an E-Commerce applications course**

### Course Objectives

The student will assist the development of an E-Commerce Applications and Software course by:

1. Reviewing possible text books for topic coverage
2. Examining similar courses for content areas
3. Finding and cataloging appropriate e-business Websites.

### Course Content

E-Business Models

Internet Marketing

Online Monetary Transactions

Legal, Ethical, and Social Issues

Security Issues

Hardware, Software, and Communication

Database Issues

World Wide Web Programming issues

## CIS 370V Computer Information Systems Practicum

### Course Description

Variable credit

*Prerequisite: Completed 12 hours in Computer Information Systems or permission of unit head*

**NOTE:** May be repeated for a total of 6 hours credit with approval of the unit head.

Introduction to research and specialized programming in computer information systems in the context of assisting with faculty research and programming projects.

Offered: As required

**Example: Assist in developing an online Microcomputer Applications course**

### Course Objectives

The student will assist the development of a Web-based course for CIS 2223 by:

1. Reviewing WEBCT capabilities
2. Examining similar courses for structure, student services, and instructional features
3. Examining publisher provided materials for online appropriateness.

### Course Content

WEBCT features

Course information

Readings

Assignments

Message service

Chat service

Grade Records

Copyright and Fair Use of materials

Available course materials for:

Microsoft Windows 2000

Microsoft Internet Explorer 5.0

Microsoft PowerPoint 2002

Microsoft Word 2002

Microsoft Excel 2002

Server access for materials

Server access for students

## **CIS 399V Special Topics**

### **Course Description**

Variable Credit (1-3 hours)

Detailed study of one of the specialized areas of computer information systems, emphasizing advanced knowledge and skills application.

Offered: As required

**Example: Reconditioning Donated Computers For Re-distribution to Local Schools**

### **Course Objectives**

The student who successfully completes this course will:

- (1) demonstrate knowledge of operating system fundamentals;
- (2) demonstrate knowledge of hardware and software installation, configuration, and upgrading;
- (3) utilize appropriate procedures for diagnosing and troubleshooting hardware and software problems; and
- (4) demonstrate knowledge of motherboard, processor, and memory characteristics.

### **Course Content**

#### Physical Conditioning

- Inspect system for completeness

- Disassemble CPU

- Inspect and clean assemblies

- Replace failed parts as necessary

- Reassemble

#### Electronic Conditioning

- Power-up

- Re-format Hard Drive

- Load operating system

- Load peripheral drivers

#### Testing

- Test computer operation

- Connect and test peripherals

Complete paperwork

Package for transfer

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## CIS 4253 CIS SECURITY

### Course Description

3 credits: 3 hours lecture

Offered: Once a Year

*Prerequisite: Grade of "C" or better in CIS 3523*

Detailed study of computer and network security, emphasizing practical hands-on exercises and projects to provide a basic understanding and proficiency in the use network security tools and protocols.

Offered: Fall

### Course Objectives:

The student who successfully completes this course will:

1. Will have a general understanding of the field of network security
2. Will be knowledgeable as to how the network security field relates to other areas of information technology
3. Will have a broad based knowledge necessary to be prepared for further study in specialized security fields
4. Will be prepared to begin study for the Computing Technology Industry Association's Security+ certification exam

### Course Content

Understanding security fundamentals including but not limited to:

- Security terminologies
- Security threats
- Security ramifications
- Goals of network security

Understanding security and classifying attacks including but not limited to:

- Denial-of-Service attacks
- IP fragmentation attacks
- Distributed denial of service attacks
- Spoofing
- Man in the middle
- Replays
- TCP session hijacking
- Social engineering
- Worms and viruses
- Attacks against encrypted data
- Software exploitation

Developing baselines including but not limited to:

- Hardening operating systems
- Hardening applications
- Hardening networks

Securing network infrastructures including but not limited to:

- Cabling
- Securing removable media

- Hardening network devices
- Designing network topologies

Web security including but not limited to:

- Protecting e-mail systems
- Examining www vulnerabilities
- Securing web communications
- Securing instant messaging

Protecting advanced communication including but not limited to:

- FTP
- L2TP
- VPNs
- WAP
- WTLS
- WLAN

Understanding cryptography including but not limited to:

- Understanding cryptography hashing algorithms
- Using encryption
- Using cryptography

Operational security including but not limited to:

- Physical security
- Social engineering
- Business continuity
- Disaster recovery

Policies and procedures including but not limited to:

- Understanding security policy
- Risk identification
- Designing security policy
- Understanding compliance monitoring and evaluation

Security management including but not limited to:

- Identity management
- Change management
- Digital rights management

Advanced security topics including but not limited to:

- Computer and network forensics
- Up and coming security solutions
- Information security jobs

## **CIS 4263 Ethics in Information Technology**

### **Course Description:**

3 credits: 3 hours lecture

Prerequisites: CIS 3523, or Permission of Instructor

Extensive and topical coverage of ethical issues associated with file sharing, infringement of intellectual property, security risks, Internet crime, identity theft, employee surveillance, privacy, and compliance.

Offered: Spring

### **Behavioral Objectives:**

The student who successfully completes this course will:

1. Demonstrate an in-depth knowledge of assessing actual global cases that has affected the information technology industry.
2. Utilize both hands-on exercises and case assignments when addressing computer security attacks and protection of an individual's privacy under the law.
3. Exhibit a thorough understanding concerning internet usage in the area of freedom of speech, as well as, key freedom of speech issues affecting use of information technology.
4. Demonstrate an in-depth knowledge of what constitutes intellectual property and the various ethical issues surrounding software manufacturers.
5. Demonstrate their ability to work within a group.
6. Demonstrate their ability to do advance research, including the collection of resources in order to construct reports and make presentations concerning the various ethical issues throughout the course.

### **Minimum Course Content:**

Specific topic coverage includes:

#### An Overview of Ethics

- The Importance of Integrity
- Ethics in the Business World
- Creating an Ethical Work Environment

#### Ethics for IT Professionals and IT Users

- The Ethical Behaviors of IT Professionals
- IT Professional Malpractice
- Supporting the Ethical Practices of IT Users
- Common Ethical Issues for IT Users

#### Computer and Internet Crime

- Increasing Complexity Increases vulnerability
- Higher Computer User Expectations
- Types of Computer Attacks
- Risk Assessment
- Educating Employees, Contractors, and Part-Time Workers

#### Privacy

- Privacy Protection and the Law
- Key Privacy and Anonymity Issues
- Identity Theft
- Consumer Profiling
- Advanced Surveillance Technology



- Freedom of Expression
  - First Amendment Rights
  - Freedom of Expression: Key Issues
- Intellectual Property
  - What is Intellectual Property
    - Copyrights
    - Patents
    - Trade Secret Laws
  - Key Intellectual Property Issues
    - Plagiarism
    - Open Source Code
    - Cyber squatting
- Software Development
  - Strategies to Engineer Quality Software
  - Key Issues in Software Development
- Employer/Employee Issues
  - Use of Nontraditional Workers
    - Contingent Workers
    - H-1B Workers
    - Offshore Outsourcing
  - Whistle-blowing
    - Protection for Whistle-blowers
    - Dealing with a Whistle-blowing Situation
- The Impact of Information Technology on the Quality of Life
  - The Impact of IT on the Standard of Living and Productivity
  - The Impact of IT on Healthcare Costs
    - Telemedicine
    - Electronic Health Records
    - Medical Information Web Sites for Lay People

## **CIS 4503 Business Data Communications**

### **Catalog Description**

3 credits: 3 hours lecture

*Prerequisite: CIS 3423 or CIS 3443*

To provide a strong introduction to both communications and networking for the computer literate student, focusing on system software.

Offered: Fall, Spring

### **Course Objective**

This course is intended to provide a strong introduction to both communications and networking for those desiring a career in computers. After successfully completing this course, students will be able to:

1. Understand data communications
2. Demonstrate knowledge of networks
3. Display ability to configure a server-client network.

### **Course Content**

Open Systems Interconnection (OSI) reference model

- Application layer
- Presentation layer
- Session layer
- Transport layer
- Network layer
- Data Link layer
- Physical layer

Understand network configurations

- LAN
- WAN
- MAN

Explore how different data signals travel via hardware

- Physical transmission media
- Wireless transmission media
- Modems

Learn how to detect and prevent data errors

Understand the links between hardware and software

Explore the layout of the Internet and its components

Discuss network security

Provide students the opportunity to build and manage server-client local area networks.

- Installing system software

- Configuring computers

- Managing user accounts

- Installing hardware

## **CIS 460V Internship in Computer Information Systems**

### **Course Description**

Variable credit (1-3 hours)

*Prerequisite: Advanced standing and permission of unit head and instructor.*

Practical experience in computer programming and database management. Students work in a business setting which allows for application of computer systems knowledge and development of information systems skills.

Offered: As required

### **Course Objectives**

An internship will allow the student to gain business experience by providing:

1. Knowledge of the business environment, and (as appropriate):
  - a. An opportunity to develop business-oriented application programs
  - b. An opportunity to manage business-oriented databases
  - c. An opportunity to conduct system analysis and design
  - d. An opportunity to work with networks.

### **Course Content**

The CIS 460V - Internship in Computer Information Systems course may be taken for 1-4 credit hours, and follow one of two possible tracks.

#### **Track One:**

The first track follows requirements more in keeping with a regular class. This track requires students participate in a work experience with an business or organization, to keep a daily log of their work experiences that is turned into the instructor for review at the completion of the work requirements, to complete a term paper about their experiences, to meet weekly with the instructor, and to be evaluated by employer supervisor and supervising instructor.

One credit hour would require 20-40 hours of work experience. Two credit hours would require 40-60 hours of work experience. Three credit hours would require 60-90 hours of work experience. Four credit hours would require 90-110 hours of work experience.

#### **Track Two:**

The second track follows requirements more in keeping with a laboratory class. This track requires the work experience with a business or organization and evaluation by employer supervisor and supervising instructor.

Each credit hour requires a minimum of 30 hours of work experience.

#### **General:**

Regardless of the track chosen, all requirements must be completed during the semester for which the student has enrolled .

## **Possible Course Content:**

Computer systems

Computer languages

Data representation

Data modeling

Database design

Database analysis

Database management

Problem solving with application programs

Programming documentation

Programming languages

BASIC

C++

COBOL

HTML

Java

Scripting (Jscript, VBscript, JAVAscript, etc.)

Structured Query

Visual Basic

Software Networking

Network Administration

Information Systems Technical Hardware

# CIS 4623 Database Management Systems

## Course Description

3 credits: 3 hours lecture

*Prerequisite: CIS 3423, CIS 3443*

Emphasis on file organization methods, file access methods, data structures for database processing and the process for database design and implementation. The study and use of Structured Query Language to develop database programs.

Offered: Fall, Spring

## Course Objectives

The student who successfully completes this course will:

1. Be able to demonstrate the value of using a Database management System to store and retrieve information
2. Understand the basic design and implementation strategies for the development of online databases
3. Be able to develop a working knowledge of a particular Database Management System
4. Develop sophisticated queries and reports based on the database
5. Learn how queries and reports can support the business decision-making process
6. Learn how to integrate a database with other programs (Word Processing, Spreadsheet, Visual BASIC).

## Course Content

### Introduction to Databases & DBMSs

Traditional File-based systems

Database approach

Definition of a database

DBMS

Components of DBMS environment

Designing a database

Roles in the database environment

History of DBMS

Advantages and disadvantages of DBMS

### Database Environment

Three-level ANSI-SPARC Architecture

External

Conceptual

Internal

Data independence

Database languages

DDL, DML, 4GL

Data models and conceptual modeling

Functions and components of a DBMS

Multi-user DBMS architectures

Introduction SQL

Relational databases

Database creation

SQL commands

    Create and drop table

    Insert and delete record

    Data types

Simple queries

Simple sorting

Advanced Queries and SQL Statements such as JOIN

Data dictionary preparation

Entity-Relationship (E-R) diagram preparation

Macros

Discussion and Exercise with Visual BASIC for Application (VBA)

Review Database Design including Discussion of "Normal" Forms

# **CIS 4633 Application Software Development Project**

## **Course Description**

3 credits: 3 hours seminar

*Prerequisite: CIS 3523, CIS 4623*

System simulation techniques; their application to business systems using appropriate simulation languages; systems design and development- extensive use of computers.

Offered: Fall, Spring

## **Course Objectives**

The student who successfully completes this course will:

1. Analyze, design, code, test, document, and present a computer system in an area of interest to the student
2. Obtain experiences which better enable the student to enter the job force with confidence
3. Demonstrate higher-level communication skills.

## **Course Content**

### **Problem Identification**

A preliminary investigation to identify the nature and scope of the problem.

### **System Analysis and Design**

A phase to determine and document not only what input, processing, and output is needed but also how to construct the system to best satisfy those needs. A test plan for validating system results will also be needed.

### **Project Programming**

The point where the system is actually constructed. Programs are written, tested, and internally documented.

### **Written Documentation**

System and user procedure manuals are completed.

### **System Presentation**

An oral presentation of your system to your peers along with project evaluation document.

### **Weekly Status Reports**

Documents designed to communicate the current status of your project.



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## **CIS 4723 Seminar in Computer Information Systems**

### **Course Description**

3 credits: 3 hours lecture

Detailed study of one of the specialized areas of computer information systems, emphasizing assigned readings and individual research.

Offered: As Required

### **Example: E-commerce Applications and Software**

### **Course Objectives**

The student who successfully completes this course will:

1. Demonstrate knowledge of E-Commerce models and security issues
2. Utilize Microsoft FrontPage 2002 for HTML programming and online publishing
3. Utilize Microsoft SQL Server as database managers
4. Utilize a scripting language (VBscript, Javascript) to create interfaces between the WWW and the database
5. Demonstrate general knowledge of basic aspects of E-Commerce programming.

### **Course Content**

#### E-Business Models

- Storefront
- Auction
- Portal
- Dynamic pricing

#### Internet Marketing

- E-mail
- Promotions
- Search engines
- Partnerships

#### Money Transactions

- Credit card
- E-Wallet
- Digital currency
- Smart money

#### Legal, Ethical, and Social Issues

- Privacy
- Defamation and explicit speech
- Patents and copyrights
- Trademark and Domain registration
- Online communities
- Disability accessibility

## Taxation

### Computer and Network Security

- Secret key cryptography
- Public key cryptography
- Key agreement protocols
- Digital Signatures
- Security protocols

### Hardware, Software and Communications

- Servers
- Clients
- Data storage
- Communication software
- Application Software
- Construction software

### Programming

- HyperText Markup Language (HTML)
- VBscript, Javascript
- Dynamic HTML
- Active Server Pages (ASP)

### SQL Server 2000 Database Architecture

- Storing data
- Database objects
  - Structure of individual data entries
  - Types of data
  - Relationship between data entities
  - Custom business rules enforced on data
- Transaction architecture

### E-commerce Website

- Database construction
- Website construction
- Interface linking

## **CIS 4723 Seminar in Computer Information Systems**

### **Course Description**

3 credits: 3 hours lecture

Detailed study of one of the specialized areas of computer information systems, emphasizing assigned readings and individual research.

Offered: As required

### **Example: Advanced Spreadsheets Using Excel**

### **Course Objectives**

The student who successfully completes this course will:

1. Utilize more advanced spreadsheets features including functions, databases, templates, macros, and data analysis tools,
2. Integrate Excel with other applications including the Internet, and
3. Exhibit higher-level communication skills.

### **Course Content**

Basic Excel Review

    Formatting

    Formulas and Functions

    Transposing

    Multi-sheets

    Charting

List Management (aka database)

Macros and Visual Basic for Applications

Application and Internet integration

Templates

Audit and Protection

Advanced Charting

Advanced Functions

Lookup Tables

Pivot Tables and Charts

Data Analysis Tools

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## **CIS479V Independent Study in Computer Information Systems**

### **Course Description**

Variable credit

Consult the Independent Study Courses subheading in the Academic Regulations section of this catalog for prerequisites and description.

Offered: As required

### **Example: Programming C++**

### **Course Objectives**

The student who successfully completes this course will be able to:

1. Understand the form of a simple C++ program
2. Create variables, operators and expressions
3. Create execution statements
4. Create program functions.

### **Course Content**

Basics

Variables and Expressions

Controlling Execution

Compound Types

Functions

Classes

Operators

Virtual Functions

Templates

# **CIS479V Independent Study in Computer Information Systems**

## **Course Description**

Variable credit

Consult the Independent Study Courses subheading in the Academic Regulations section of this catalog for prerequisites and description.

Offered: As required

## **Example: Programming Dynamic HTML**

## **Course Objectives**

The student who successfully completes this course will be able to:

1. Create World Wide Web pages using style sheets
2. Create World Wide Web pages using Javascript
3. Create World Wide Web pages using a form for data collection

## **Course Content**

### Style Sheets

- Methods for incorporating in WWW pages
- Attaching style sheet properties to HTML tags
- Creating Property rules
  - The declaration
  - The value
- Cascading style sheets

### JAVAscript

- Origins and History
- Using standard scripts (Dates, counting, etc.)
- Creating buttons
- Creating dialog and action boxes
- Creating database interfaces using ASP pages

### Forms

- Form Methods of data handling
- Form Actions for data routing
- Form inputs
  - Input boxes
  - Textareas
  - Checkboxes
  - Radio buttons
- Coding forms within standard HTML coding

## **CIS 589V Special Topic in Computer Information Systems**

### **Course Description**

Variable credit

Graduate level detailed study of one of the specialized areas of computer information systems, emphasizing advanced study and skills application.

Offered: As required

### **Course Objectives**

This course is offered in conjunction with a regularly scheduled undergraduate CIS course and is intended for graduate students in other academic units at this university. The objectives for the undergraduate course will obtain here. Additional objectives may be negotiated by the Instructor of the course and the student.

### **Course Content**

The course content will follow the content of the undergraduate course and will be supplemented by additional course work suitable for a graduate-level course. This supplemental work will be negotiated by the instructor and the student, with input from the student's advisor in her/his home academic unit.



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