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

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Curriculum Courses:

Objectives and Minimum Content

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University of Arkansas - Monticello
Division of Computer Information Systems

2005

CIS Course Prerequisites

Course Name		Prerequisites
CIS 1013	Intro to Computer-Based Systems	None
CIS 2193	PC Hardware and Software Maintenance	CIS1013 and CIS 2223
CIS 2203	Programming Microcomputer Systems	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	Introduction to Java Programming	GE Math, Min of "C" in CIS 2203
CIS 3423	COBOL	GE Math, Min of "C" in CIS 2203
CIS 3433	Introduction 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 3623	Database Management Systems	CIS 3423 and CIS3443
CIS 370V	Practicum in CIS	Min of 12 hours of CIS Courses
CIS 4253	CIS Security	CIS 3523
CIS 4503	Business Data Communications	CIS 3423 or CIS 3443
CIS 460V	Internship in CIS	Advanced Standing (70+ hours)
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 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

2005-2007 Catalog

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.

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 2193 PC Hardware and Software Maintenance

Course Description

3 credits: 3 hours lecture

Prerequisites: CIS 1013 and CIS 2223
An introduction to computer maintenance, emphasizing hardware and software management, system maintenance, and troubleshooting in the PC environment.

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 for Micro Computers

Course Description

3 credits: 3 hours lecture
Introduction to operating systems and logical information flow using the BASIC language. Emphasis on student programming to solve problems in several disciplines.

Course Objective:

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 QBASIC language

2. Utilize the QBASIC software to: 1) execute, and 2) use of editorial commands to copy, move and delete statements

3. Display their ability to logically solve word problems

4. Exhibit their ability to construct program flowcharts, 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

Understanding of the components of a computer system and the QBASIC editorial environment

The Programming Process procedures and the use of QBASIC statements to write programs

The use of String variables, Input statements and advanced printing techniques

Use of condition statements and DO ... LOOP statements, as well as, nested DO/LOOPS

Use of READ/DATA and INPUT statements

The various @ of decision statements
- The IF statement
- The Nested IF statement
- Multiple Alternative statements
- SELECT/CASE statements

Writing programs using SUB and FUNCTION programs

Learning to control the screen using LOCATE and COLOR features

Use of FOR/ NEXT loops, Variations of the loops, and nesting the loops
Utilizing Numeric and String Functions

Understanding and using One and Two-Dimensional Arrays

Loading arrays
Programming a Bubble Sort
Sorting Parallel arrays
Searching arrays

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.

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.

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: 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.

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: Once a Year

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
Offered: Once a Year
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.

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: 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.

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.

Course Objectives

The student who successfully completes this course will:

1. Demonstrate knowledge of WWW site design
2. Demonstrate in-depth knowledge of HTML programming
3. Utilize Microsoft FrontPage as an authoring tool for HTML programming
4. Exhibit the ability to manipulate text and graphics formatting
5. Demonstrate knowledge of Java Applet and Javascript programming
6. Exhibit the ability to develop HTML programs for WWW submitted forms.

Course Content

Understanding of HTML programming and the Microsoft FrontPage authoring tool for HTML programming to create:

- Basic text tags
- Graphics insertion and manipulation
- Hypertext links to other Web pages
- Audio and visual document insertions
- Bookmarks to other sections of the same page
- Lists
- Tables
- Frames

Understanding of text and graphics formatting, including:

- Scanning hardcopy documents
- Using text documents
- Creating and using Adobe Acrobat documents
- Adding PowerPoint documents
- Creating graphics files
- Changing graphic file formatting
- Editing graphic files
- Mapping graphic files
- Constructing animated graphic files

Programming style sheets to create special effects

- Methods for incorporating styles
- Style rules
- Cascading styles
- Multiple style elements

Programming Java Applets
- Calling Applets
- Passing parameters into Applets

Programming Javascript
- Manipulating page loading
- Creating information and dialog boxes
- Creating action buttons
- Creating pop-up windows

HTML programming WWW submitted forms
- Form methods
- Form actions
- Form input types
- Form submission

CIS 3523 Structured System Analysis and Design

Catalog Course Description

3 credits: 3 hours lecture
Prerequisites: 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.

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 3rd 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.

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

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

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.

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

Example: Assist in developing an online Microcomputer Applications course

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.

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 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.

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 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.

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.

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.

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.

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

Example: E-commerce Applications and Software

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.

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

Example: Advanced Spreadsheets Using Excel

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.

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

Example: Programming C++

Course Description

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

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

Example: Programming Dynamic HTML

Course Description

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

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.

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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