Midland College
Master Syllabus

Computer Programming and Analytics

BCIS 1305 - Business Computer Applications SCH (3-1)
COSC 1420 - C Programming (3-2)
COSC 1436 - Programming Fundamentals I SCH (3-2)
COSC 1437 - Programming Fundamentals II SCH (3-2)
COSC 2336 - Programming Fundamentals III SCH (3-1)
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INEW 2334 - Advanced Web Programming SCH (3-1)
ITSC 1305 - Introduction to PC Operating Systems SCH (3-1)
ITSC 1315 - Project Management Software SCH (3-1)
ITSE 1345 - Introduction to Oracle SQL SCH (3-1)
ITSE 2313 - Web Authoring SCH (3-1)
ITSE 2354 - Advanced Oracle PL/SQL SCH (3-1)
ITSE 2356 - Oracle Database Administration I SCH (3-1)
ITSE 2358 - Oracle Database Administration II SCH (3-1)

COURSE DESCRIPTIONS AND LEARNING OUTCOMES

BCIS 1305 - Business Computer Applications SCH (3-1)
Introduces and develops foundational skills in applying essential and emerging business productivity information technology tools. The focus of this course is on business productivity software applications, including word processing, spreadsheets, databases, presentation graphics, data analytics, and business-oriented utilization of the internet.
(BCIS 1305 is included in the Business Field of Study.)

Prerequisite: None

Learning Outcomes - Upon successful completion of this course, students will:
SLO1. Describe the fundamentals of information technology concepts – hardware, software, security, and privacy.
SLO2. Demonstrate proper file management techniques to manipulate electronic files and folders in local, network, and online environments.
SLO3. Create business documents with word processing software using spelling and grammar check, format and layout, tables, citations, graphics, and mail merge.
SLO4. Create business documents and analyze data with spreadsheet software using (1) tables, sorting, filtering, charts and graphics, pivot tables, macros; (2) statistical, financial, logical, and look-up functions and formulas; and (3) add-ins.
SLO5. Create business multimedia presentations with presentation software using templates, lists, groups, themes, colors, clip art, pictures, tables, transitions, animation, video, charts, and views.

SLO6. Create databases and manage data with database software using tables, fields, relationships, indexes, keys, views, queries, forms, reports, and import/export functions.

SLO7. Integrate business software applications.

SLO8. Use web-based technologies to conduct ethical business research.

SLO9. Use "goal-seeking" and "what-if analysis" to solve problems and make adjustments/recommendations in a business environment.

COSC 1420 - C Programming (3-2)

Introduces the fundamental concepts of structured programming in the C language. Topics include data types; control structures; functions, structures, arrays, pointers, pointer arithmetic, unions, and files; the mechanics of running, testing, and debugging programs; introduction to programming; and introduction to the historical and social context of computing.

Prerequisite: None

Learning Outcomes - Upon successful completion of this course, students will:

SLO1. Analyze and explain the behavior of simple programs involving the fundamental programming constructs. Categorize different programming languages and their uses.

SLO2. Modify and expand short programs that use standard conditional and iterative control structures and functions; choose appropriate conditional and iteration constructs for a given programming task.

SLO3. Design, implement, test, and debug a program that uses each of the following fundamental programming constructs: basic computation, simple I/O, standard conditional and iterative structures, and the definition of functions.

SLO4. Apply the techniques of structured (functional) decomposition to break a program into smaller pieces.

SLO5. Describe the mechanics of parameter passing and demonstrate the difference between call-by- value and call-by-reference parameter passing.

SLO6. Discuss the importance of algorithms in the problem-solving process, identify the necessary properties of good algorithms, and create algorithms for solving simple problems.

SLO7. Use pseudocode or a programming language to implement, test, and debug algorithms for solving simple problems.

SLO8. Discuss the representation and use of primitive data types and built-in data structures. Explain the reasons for using different formats to represent numerical data.

SLO9. Explain basic concepts of secure programming functions. Discuss the properties of good software design.

SLO10. Describe the phases of program translation from source code to executable code and the files produced by these phases; explain the software life cycle and its phases, including the deliverables that are produced.

COSC 1436 - Programming Fundamentals I SCH (3-2)

Introduces the fundamental concepts of structured programming and provides a comprehensive introduction to programming for computer science and technology majors. Topics include software development methodology, data types, control structures, functions, arrays, and the mechanics of

running, testing, and debugging. This course assumes computer literacy.
(COSC 1436 is included in the Field of Study Curriculum for Computer Science.)

Prerequisite: None

Learning Outcomes - Upon successful completion of this course, students will:

SLO1. Describe how data are represented, manipulated, and stored in a computer

SLO2. Categorize different programming languages and their uses.

SLO3. Understand and use the fundamental concepts of data types, structured programming, algorithmic design, and user interface design.

SLO4. Demonstrate a fundamental understanding of software development methodologies, including modular design, pseudo code, flowcharting, structure charts, data types, control structures, functions, and arrays.

SLO5. Develop projects that utilize logical algorithms from specifications and requirements statements.

SLO6. Demonstrate appropriate design, coding, testing, and documenting of computer programs that implement project specifications and requirements.

SLO7. Apply computer programming concepts to new problems or situations.

COSC 1437 - Programming Fundamentals II SCH (3-2)

This course focuses on the object-oriented programming paradigm, emphasizing the definition and use of classes along with fundamentals of object-oriented design. The course includes basic analysis of algorithms, searching and sorting techniques, and an introduction to software engineering processes. Students will apply techniques for testing and debugging software. (This course is included in the Field of Study Curriculum for Computer Science.)

Prerequisite: COSC 1336/1436 – Programming Fundamentals I

Learning Outcomes - Upon successful completion of this course, students will:

SLO1. Identify and explain a programming development lifecycle, including planning, analysis, design, development, and maintenance.

SLO2. Demonstrate a basic understanding of object-oriented programming by using structs and classes in software projects.

SLO3. Use object-oriented programming techniques to develop executable programs that include elements such as inheritance and polymorphism.

SLO4. Document and format code in a consistent manner.

SLO5. Apply basic searching and sorting algorithms in software design.

SLO6. Apply single- and multi-dimensional arrays in software.

SLO7. Use a symbolic debugger to find and fix runtime and logical errors in software.

SLO8. Demonstrate a basic understanding of programming methodologies, including object-oriented, structured, and procedural programming.

SLO9. Describe the phases of program translation from source code to executable

COSC 2336 - Programming Fundamentals III SCH (3-1)

Further applications of programming techniques, introducing the fundamental concepts of data structures and algorithms. Topics include data structures (including stacks, queues, linked lists, hash

tables, trees, and graphs), searching, sorting, recursion, and algorithmic analysis. Programs will be implemented in an appropriate object oriented language.

(COSC 2336 is included in the Field of Study Curriculum for Computer Science.)

Prerequisite: COSC 1337/1437 – Programming Fundamentals II

Learning Outcomes - Upon successful completion of this course, students will:
SLO1. Design and develop programs that implement basic data structures, including stacks, queues, linked lists, hash tables, trees, and graphs.
SLO2. Apply recursive techniques and algorithms to solve problems.
SLO3. Implement searching and sorting algorithms.
SLO4. Understand algorithm efficiency, Big-O notation, and why it should be considered in programming.
SLO5. Analyze and select appropriate data structures to implement a solution to a problem.
SLO6. Design and implement data structures using classes and incorporating object-oriented concepts.
SLO7. Demonstrate best practices of software development including testing, validation, and documentation.

INEW 1340 - ASP.NET Programming SCH (3-1)
Server side web programming concepts to implement solutions for common web programming tasks. Includes Basic ASP.NET web controls, user management and authentication, state management, and development of database-driven web applications.

Prerequisite: COSC 1336 and ITSE 1345

Learning Outcomes - Upon successful completion of this course, students will:
SLO1. Plan and develop a site using ASP.NET
SLO2. Develop ASP.NET websites using n-tier design
SLO3. Analyze database models to support ASP.NET applications
SLO4. Design and implement database models to support ASP.NET applications
SLO5. Demonstrate knowledge and understanding of ASP.NET vocabulary and terms

INEW 2334 - Advanced Web Programming SCH (3-1)
Web programming using industry-standard languages and data stores.

Prerequisite: INEW 1340 or instructor permission

Learning Outcomes - Upon successful completion of this course, students will:
SLO1. Design, develop, test and document a dynamic web application
SLO2. Develop connectivity between data store and website

ITSC 1305 - Introduction to PC Operating Systems SCH (3-1)
Introduction to personal computer operating systems including installation, configuration, file management, memory and storage management, control of peripheral devices, and use of utilities and software applications.

Prerequisite: None

Learning Outcomes - Upon successful completion of this course, students will:

SLO1. Install, configure and maintain the operating system
SLO2. Perform basic file management operations
SLO3. Organize and allocate primary and secondary storage
SLO4. Access and control peripheral devices
SLO5. Run utilities

ITSC 1315 - Project Management Software SCH (3-1)

Use of project management software for developing a project plan including timelines, milestones, scheduling, life cycle phases, management frameworks, skills, processes, and tools.

Prerequisite: None

Learning Outcomes - Upon successful completion of this course, students will:

SLO1. Use project management software to plan and manage a project
SLO2. Organize and evaluate project phases
SLO3. Produce reports and charts
SLO4. Distinguish task relationships
SLO5. Demonstrate teamwork
SLO6. Understand project management concepts and principles

ITSE 1345 - Introduction to Oracle SQL SCH (3-1)

An introduction to the design and creation of relational databases using Oracle. Topics include storing, retrieving, updating, and displaying data using Structured Query Language (SQL).

Prerequisite: None

Learning Outcomes - Upon successful completion of this course, students will:

SLO1. Write Structured Query Language (SQL) statements using Oracle
SLO2. Select and sort data
SLO3. produce reports with SQL*Plus
SLO4. Create, manage, normalize tables, incorporate constraints
SLO5. Create database objects, including views

ITSE 2313 - Web Authoring SCH (3-1)

Instruction in designing and developing web pages that incorporate text, graphics, and other supporting elements using current technologies and authoring tools. Create web pages and supporting elements using current authoring tools; and maintain web pages and supporting elements.

Prerequisite: None

Learning Outcomes - Upon successful completion of this course, students will:

SLO1. Define HTML & CSS terms
SLO2. Create web pages and supporting elements using current authoring tools
SLO3. Maintain web pages and supporting elements
SLO4. Publish web documents and web sites to the Internet.

ITSE 2354 - Advanced Oracle PL/SQL SCH (3-1)

Advanced use of Oracle SQL. Topics include hierarchical queries, set based queries, correlated subqueries, scripting, and scripting generation.

Prerequisite: ITSE 1345

Learning Outcomes - Upon successful completion of this course, students will:

SLO1. Retrieve data including SET operators
SLO2. Correlated subqueries and hierarchical queries
SLO3. Create a package to group together variables, cursors, exceptions, procedures, and functions
SLO4. Invoke a package constraint

ITSE 2356 - Oracle Database Administration I SCH (3-1)

Fundamentals of the tasks and functions required of a database administrator using Oracle.

Prerequisite: ITSE 1345

Learning Outcomes - Upon successful completion of this course, students will:

SLO1. Create an operational database using Oracle
SLO2. Create, delete, and modify associated files, tablespaces, segments, extents, and blocks
SLO3. Start up and shut down an Oracle instance and database
SLO4. Add, delete, and modify users, privileges, and resources
SLO5. Demonstrate use of National Language and Support (NLS) features

ITSE 2358 - Oracle Database Administration II SCH (3-1)

A continuation of Oracle Database Administration I. Topics include recovery procedures, logical backups, standby database capabilities, and performance tuning of the Oracle Server. Common performance problems and the use of diagnostic tools to troubleshoot and optimize throughput will be discussed.

Prerequisite: ITSE 2356

Learning Outcomes - Upon successful completion of this course, students will:

SLO1. List the Oracle backup and recovery components
SLO2. Formulate a backup and recovery strategy
SLO3. Practice backup and recovery operations
SLO4. Use Oracle tools to diagnose performance problems
SLO5. Optimize and troubleshoot Oracle database performance.

PARTICIPATION STATEMENT:

Students must actively participate by completing an academic assignment by the official census date. Students who do not do so, may be dropped from the course.

REQUIRED COURSE MATERIALS:

Will be current. Students should contact their instructor prior to purchasing the text and supplies to confirm required course materials.

STUDENT CONTRIBUTIONS, RESPONSIBILITES AND CLASS POLICIES:

Will be posted by the instructor in individual course syllabus. Students should contact their instructor if they have any questions.

ACADEMIC INTEGRITY:

Refer to Midland College's Scholastic Dishonesty and Academic Misconduct policy:
https://www.midland.edu/about/public-info/scholastic-dishonesty.php

HONORS PROGRAM:

Students interested in taking a course for honors credit, should contact their instructor. Refer to the Midland College Honors Program webpage for more details:
https://www.midland.edu/academics/honors.php

DROPPING THE COURSE:

Check the MC College Calendar for the last day to withdraw from the course and receive a "W." Please talk to the instructor before withdrawing.

EVALUATION OF STUDENTS:

Will be posted by the instructor in individual course syllabus. Students should contact their instructor if they have any questions.

NON-DISCRIMINATION STATEMENT:

Midland College does not discriminate on the basis of race, color, national origin, sex, disability or age in its programs and activities. For information and inquiries regarding Midland College's non-discrimination policies, go to: https://www.midland.edu/about/tix/index.php

For further information on notice of non-discrimination, visit the ED.gov Office of Civil Rights website, or call 1 (800) 421-3481.

DISABILITY SUPPORT SERVICES:

Any student who, because of a disabling condition, may require some special arrangements to meet course requirements should contact disabilities support services as soon as possible at:
https://midland.edu/services-resources/accommodation-services.php.

Conditions may include documented physical or educational disabilities. Please be aware that services or accommodations are not automatic. Each student must request them and secure the proper authorizations/documentation. Accessibility Links can be found on the Pages tab in Canvas.

DIVISION OFFICE CONTACT INFORMATION