MINNESOTA WEST COMMUNITY & TECHNICAL COLLEGE
COURSE OUTLINE

Faculty are required to have the outline submitted to the Academic Affairs Office. The course outline is the form used for approval of new courses by the Collegewide Curriculum Committee.

DEPT.: Computer Science COURSE NO.: 2245
NUMBER OF CREDITS: 4
COURSE TITLE: Fundamentals of Programming II

CATALOG DESCRIPTION: Discusses topics including object-oriented programming techniques, essential data structures such as stacks, queues, trees, sorting, and searching algorithms using a high-level programming language.

AUDIENCE: former or current programming students who have met the prerequisite

FULFILLS MN TRANSFER CURRICULUM AREA(S) (Leave blank if not applicable)
Area : by meeting the following competencies:
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PREREQUISITES OR NECESSARY ENTRY SKILLS/KNOWLEDGE:
CSCI2240 Fundamentals of Programming I

LENGTH OF COURSE: 1 semester

THIS COURSE IS USUALLY OFFERED:
Independent Study Spring Semester

Four goals are emphasized in course at Minnesota West Community & Technical College:
1) ACADEMIC CONTENT:
Materials such as hands-on exercises, lecture, review questions, programming problems, terminology, chapter summaries and applicable case studies blends practical programs with learned programming concepts to provide a basic background for continuing a study in computer science.

2) THINKING SKILLS: Students realize the benefits of learning to program computers by developing thinking abilities to solve problems of all kinds; to break a problem into manageable parts and to think in logical ways. Programming also allows one to be creative.

3) COMMUNICATIONS SKILLS:
Develops the ability to describe verbally and in writing the processes of program design.

4) HUMAN DIVERSITY:
Provides an opportunity for students to work in teams to solve challenging programming problems.

TOPICS TO BE COVERED:
Pointers
Operator Overloading
Inheritance
Polymorphism
Stream Input/Output
Exception Handling
File Processing
Searching and Sorting
Linked Lists
Stacks, Queues, Trees

LIST OF EXPECTED COURSE OUTCOMES:
a. Develop and implement correct and efficient programs using the C++ language.
b. Define, compare, and contrast the fundamental concepts of object-oriented programming: data abstraction, encapsulation, inheritance, and polymorphism.
c. Design algorithms according to object-oriented concepts.
d. Design and develop classes which implement the concepts of data abstraction, encapsulation, inheritance, and polymorphism.
e. Design and develop programs implementing data structures utilizing the Standard Template Library
f. Implement exception handling.
g. Examine searching and sorting algorithms
h. Define the finer points of pointers, dynamic allocation, linked list, stacks, queues, trees

LEARNING/TEACHING TECHNIQUES used in the course are:
Collaborative Learning Problem Solving
Student Presentations Interactive Lectures
Creative Projects Individual Coaching
Lecture Films/Videos/Slides
Demonstrations Other (describe below)
Lab

ASSIGNMENTS AND ASSESSMENTS FOR THIS CLASS INCLUDE:
Reading Tests Individual Projects
Oral Presentations Worksheets Collaborative Projects
Textbook Problems Papers Portfolio
Group Problems Term Paper
Other (describe below)

EXPECTED STUDENT LEARNING OUTCOMES:
a. will develop and implement correct and efficient programs using the C++ language.
b. will define, compare, and contrast the fundamental concepts of object-oriented programming: data abstraction, encapsulation, inheritance, and polymorphism.
c. will design algorithms according to object-oriented concepts.
d. will design and develop classes which implement the concepts of data abstraction, encapsulation, inheritance, and polymorphism.
e. will design and develop programs implementing data structures utilizing the Standard Template Library
f. will implement exception handling.
g. will examine searching and sorting algorithms
h. will define the finer points of pointers, dynamic allocation, linked list, stacks, queues, trees

The information in this course outline is subject to revision
**Veteran Services:** Minnesota West is dedicated to assisting veterans and eligible family members in achieving their educational goals efficiently. Active duty and reserve/guard military members should advise their instructor of all regularly scheduled military appointments and duties that conflict with scheduled course requirements. Instructors will make every effort to work with the student to identify adjusted timelines. If you are a veteran, please contact the Minnesota West Veterans Service Office.

To receive reasonable accommodations for a documented disability, please contact the campus Student Services Advisor or campus Disability Coordinator as arrangements must be made in advance. In addition, students are encouraged to notify their instructor.

This document is available in alternative formats to individuals with disabilities by

- contacting the Student Services Advisor or by calling 800-658-2330 or
- Minnesota Relay Service at 800-627-3529 or by using your preferred relay service.

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