COMPUTER PROGRAMMING
ASSOCIATE OF APPLIED SCIENCE (AAS) – 60 CREDITS

About this program

This program provides the programming skills needed in computer application development, database management, computer systems and data communications. Students learn to design, write, code, document and implement computer programs for various computer platforms. They learn at least one operating system, one command-level language, one database management system and other high-level programming languages. The program prepares students to design and develop computer software systems and to design information management systems. It includes the study of languages, software design, information flow and processing. Students study the design of mathematical and simulation models and large-scale programs used for processing and retrieving information.

Program outcomes

1. Demonstrate professionalism including presentation skills, utilizing research for problem solving, working independently and in teams, being accountable and meeting deadlines.
2. Analyze business problems and prepare program definitions for computerized solutions.
3. Create, document and implement computerized solutions using a variety of languages.
4. Apply testing and debugging methods to assure quality and workability of finished programs.
5. Solve problems using appropriate mathematical and/or scientific techniques.

Curriculum overview

Crds	Requirement type
42	Required courses
3	Restricted electives in courses
6	Restricted electives in subjects
3	Restricted electives in MnTC Goal Areas
6	Restricted electives in course types
60	**Total**

Developmental courses note: A student may be required to enroll in developmental courses in reading, writing and math. A student's scores on the Accuplacer assessment will determine enrollment in developmental courses. The purpose of developmental courses is to prepare students for the demands of a college-level curriculum. *Credits may vary.*

Accreditation: Minnesota State Community and Technical College is accredited by the Higher Learning Commission, a regional accreditation agency recognized by the U.S. Department of Education. The Higher Learning Commission 230 South LaSalle Street, Suite 7-500 Chicago, IL 60604-1411 http://www.ncahigherlearningcommission.org Phone: 312.263.0456 / 800.621.7440

Curriculum requirement details

Required courses

Course	Crds
CPTR1001 - Introduction To Programming and Scripting	3
CPTR1106 - Microcomputer Databases	3
CPTR1115 - COBOL Programming	4
CPTR1129 - RPG Programming	4
CPTR2001 - Scripting for Automation	3
CPTR2224 - Linux I	3
CPTR2230 - Structured Query Language	3
CPTR2238 - Database Integration	3
CPTR2242 - Java Programming	3
CPTR2255 - Software Security and Testing	3
CSCI1110 - Informatics	3
CSCI1121 - Computer Science I	4
ENGL1101 - College Writing	3

Other requirements or restricted electives

3 credits from one or more of these Courses:

Course title	Credits
COMM1120 - Introduction to Public Speaking	3
COMM1130 - Small Group Communication	3
COMM1140 - Interpersonal Communication	3

6 credits from one or more of these Subjects:

- CPTR
- CSCI
- CSEC

3 credits from these Goal Areas:

- 4. Mathematics/Logical Reasoning

6 credits from these Course Types:

- General Education w/MnTC Goals

Special Requirement: 0 credits

- CPTR1100 and CPTR1104 will NOT be counted as technical electives in the Computer Programming AAS.

Course summaries

CPTR1001 - Introduction To Programming and Scripting ..... ***(3 credits)***
This course is an introduction to computer programming. Emphasis will be on programming concepts, program design methodology, program debugging, problem solving and writing clear code.

CPTR1106 - Microcomputer Databases ..... ***(3 credits)***
This course covers database concepts, design and construction using the latest database software. Topics include database normalization and table relationships, database objects, file creation, file manipulation, queries, macros, form development and report generation. Database programming concepts will also be introduced.

CPTR1115 - COBOL Programming ..... ***(4 credits)***
This course provides an overview of the COBOL programming language. Students will gain a solid foundation in the fundamentals of COBOL coding including knowledge of COBOL syntax, program structure, program design, execution and debugging. Maintenance and modification of typical business applications will also be coded throughout the course.

CPTR1129 - RPG Programming ..... ***(4 credits)***
This course is an introduction to RPG programming and AS400 system operations. The student will learn the basics of operating the AS400 and begin writing RPG programs. These programs will include building physical files, writing RPG code, compiling, error finding and producing reports. There will be a strong emphasis on developing logic to program more intermediate RPG programs. A high concentration will be on the structure of the student's calculation specifications. Students will learn how to add, delete and update data to physical files through their RPG programs. Students also will be developing screen programs where users can enter data.

CPTR2001 - Scripting for Automation ..... ***(3 credits)***
Students will build on the skills learned in Introduction to Programming and Scripting. Students will learn scripting styles, procedures and methods for system, database, web and network environments.

Prerequisites:

- CPTR1001

CPTR2224 - Linux I ..... ***(3 credits)***
This course deals with Linux installation, configuration and system administration. This course lays the groundwork for continued study of Linux.

CPTR2230 - Structured Query Language ..... ***(3 credits)***
This course covers the basics of SQL (Structured Query Language) programming. SQL is a popular computer language that is used by small and large business organizations and computer programmers. The primary purpose of SQL is in working with databases and relational database management systems to store, retrieve, edit, manipulate and format data for end users and decision makers.

Prerequisites:

- CPTR1106

CPTR2238 - Database Integration ..... ***(3 credits)***
This course covers the integration of data from multiple databases with strategies for development of integrated database applications. Development of new databases and maintenance of existing databases is covered, in addition to the storage, organization and analysis of data.

CPTR2242 - Java Programming ..... ***(3 credits)***
In this course the student utilizes the Java programming language to create both Internet applets and applications.

CPTR2255 - Software Security and Testing ..... ***(3 credits)***
This course is an introduction to software security and testing. Students will learn the importance of this aspect of software development by exploring historical and current needs in the area of stable and secure software development. The use of development operations in these areas will be included.

CSCI1110 - Informatics ..... ***(3 credits)***
This course explores how data is gathered and analyzed and how it can be applied to information technology solutions to maximize the benefits of data analysis, including increases in the efficiency and productivity of information systems. Students will explore the social, ethical and personal implications of implementing information technologies and how information processes can impact business on a local and global level.

CSCI1121 - Computer Science I ..... ***(4 credits)***
This course is an introduction to computer science. It includes algorithm design and structured programming using a high-level programming language. Key components of this course are designing, coding, debugging and documenting programs using techniques of good programming style. This course is intended primarily as a first course for computer science majors and/or minors.

ENGL1101 - College Writing ..... ***(3 credits)***
Meets MnTC Goal Area 1. This is an introductory writing course designed to prepare students for later college and career writing. The course focuses on developing fluency through a process approach, with particular emphasis on revision. Students will consider purpose and audience, read and discuss writing and further develop their own writing processes through successive revisions to produce polished drafts. Course work will include an introduction to argumentative writing, writing from academic sources and a short research project.

Prerequisites:

- Completion of ELL1080, ENGL0096, or ENGL0097 with a grade of C or higher OR placement into college-level English.

COMM1120 - Introduction to Public Speaking ..... ***(3 credits)***
Meets MnTC Goal Area 1. This course clarifies the process of oral communication, clarifies the basic principles of public speaking and allows the student to increase the application of these principles while both speaking and listening.

COMM1130 - Small Group Communication ..... ***(3 credits)***
Meets MnTC Goal Areas 1 and 2. This course focuses on communication issues in small groups and the importance of small group work in business today. An emphasis will be placed on improving communication skills for successful teamwork, group cohesiveness and the responsibility to group goals and tasks. Students will be provided with opportunities to build their group communication skills through practice.

COMM1140 - Interpersonal Communication ..... ***(3 credits)***
Meets MnTC Goal Area 1. This course will focus on improving students' abilities to communicate effectively in one-to-one dyadic encounters by providing experience-based instruction. Extensive in-class and out-of-class analyses allow the student to examine his/her own and others' informal social interactions. The long-term goal is for the student to apply interpersonal communication theories to daily interactions and draw his/her own conclusions about the effectiveness of interpersonal communication.

COMPUTER PROGRAMMING

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Program Plan — "Computer Programming - Fall Start"

Locations: Moorhead,Online

1st Fall Term (15 credits)

Courses

Course	Crds
CPTR1001 - Introduction To Programming and Scripting	3
CPTR1106 - Microcomputer Databases	3
CPTR2224 - Linux I	3
CSCI1110 - Informatics	3

3 credits in one or more of the following:

Goal Area 4. Mathematics/Logical Reasoning

0 credits in one or more of the following:

CPTR1100 and CPTR1104 will NOT be counted as technical electives in the Computer Programming AAS.

1st Spring Term (16 credits)

Courses

Course	Crds
CPTR1115 - COBOL Programming	4
CPTR2001 - Scripting for Automation	3
CPTR2230 - Structured Query Language	3
CPTR2242 - Java Programming	3
ENGL1101 - College Writing	3

2nd Fall Term (14 credits)

Courses

Course	Crds
CPTR1129 - RPG Programming	4
CSCI1121 - Computer Science I	4

6 credits in one or more of the following:

Course Subject: CPTR

Course Subject: CSCI

Course Subject: CSEC

2nd Spring Term (15 credits)

Courses

Course	Crds
CPTR2238 - Database Integration	3
CPTR2255 - Software Security and Testing	3

3 credits in one or more of the following:

COMM1120 - Introduction to Public Speaking 3
COMM1130 - Small Group Communication 3
COMM1140 - Interpersonal Communication 3

6 credits in one or more of the following:

General Education w/MnTC Goals