

# INFORMATION TECHNOLOGY - DATABASE ADMINISTRATION

## ASSOCIATE OF APPLIED SCIENCE (AAS) - 60 CREDITS

### About this program

This program prepares students for careers in support, maintenance, and administration of database management systems in a wide variety of market segments. Students will learn how to implement security measures while performing database administration tasks, generate database-driven reports to support business intelligence, apply ethical and security practices in handling data, establish interconnectivity of databases and web services, use testing and debugging methods, devise backup and recovery measures in a database environment and learn the software development life cycle. This program teaches students the skills and knowledge for occupations such as database administrator, database analyst, data analyst or database support specialist.

### Program outcomes

1. Function effectively within teams.
2. Demonstrate professionalism, including presentation skills, utilizing research for problem solving, working independently and in teams, being accountable and meeting deadlines.
3. Implement security measures while performing database administration tasks.
4. Generate database-driven reports to support business intelligence.
5. Demonstrate appropriate ethical and security practices in handling data.
6. Establish interconnectivity of databases and web services.
7. Apply testing and debugging methods to assure quality and workability of finished product.
8. Devise backup and recovery measures in a database environment.
9. Demonstrate knowledge of the software development life cycle and how the database layer is managed and administered.

### Curriculum overview

Crds	Requirement type
60	Required courses
60	<b>Total</b>

**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. More information can be found at [www.minnesota.edu/accreditation](http://www.minnesota.edu/accreditation).

## Curriculum requirement details

### Required courses

### Other requirements or restricted electives

<b>Course</b>	<b>Crds</b>
CPTR1001 - Introduction To Programming and Scripting .....	3
CPTR1106 - Microcomputer Databases .....	3
CPTR1108 - CISCO 1 .....	3
CPTR1170 - Web Engineering I .....	3
CPTR2210 - Database Report Generation .....	3
CPTR2224 - Linux I .....	3
CPTR2230 - Structured Query Language .....	3
CPTR2234 - Linux II .....	3
CPTR2240 - Database Administration .....	3
CPTR2245 - Enterprise Network Technologies .....	3
CPTR2260 - Advanced Structured Query Language ....	3
CPTR2272 - Network Operating Systems .....	3
CPTR2275 - Data Analytics .....	3
CSCI1121 - Computer Science I .....	4
ENGL1101 - College Writing .....	3
HUM2236 - Technology in the Humanities .....	3
MATH1100 - World of Math .....	3
MATH1114 - College Algebra .....	4
MATH1213 - Introduction to Statistics .....	4

## 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.

### **CPTR1108 - CISCO 1** ..... (3 credits)

This is an introduction to networks course that covers the architecture, structure, functions and components of the Internet and other computer networks. Students achieve a basic understanding of how networks operate while building simple local area networks (LANs). Students perform basic configurations for routers and switches and implement Internet Protocol.

### **CPTR1170 - Web Engineering I** ..... (3 credits)

This course is an introduction to programming and maintaining professional Web pages for the business environment. Topics will include page design, authoring tools, accessibility issues and Web page and website development. Focus will be given to client-side programming languages such as HTML and JavaScript, Web server software, Web server maintenance and Internet protocols.

### **CPTR2210 - Database Report Generation** ..... (3 credits)

Students will be introduced to database reporting using commonly used tools. Examples include Microsoft Structured Query Language (SQL) Reporting Services, comma-separated values (CSV), Microsoft Access and Excel, and Crystal Reports. Students will understand ethical and security concerns and challenges of database reporting. This course will cover the best practices of database reporting and help students understand business requirements behind database reporting.

#### **Prerequisites:**

### **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:**

### **CPTR2234 - Linux II** ..... (3 credits)

The primary focus of this course is Linux networking, security, ethics and privacy.

#### **Prerequisites:**

### **CPTR2240 - Database Administration** ..... (3 credits)

Students in this course will identify core database concepts and create database models. Installation, configuration and maintenance of a database management system (DBMS) will be covered. Students will analyze and administer a database's performance optimization. Additional topics will include user administration within the database, backup and restoration, and database normalization.

#### **Prerequisites:**

### **CPTR2245 - Enterprise Network Technologies** ..... (3 credits)

This course will introduce information technologies used in an enterprise network environment. Possible technologies the course will cover are SANs, virtualization, clustering, enterprise wireless, VPN connectivity, structured cabling and network management. The course will discuss how these technologies provide 24/7 availability and introduce the concept of green technologies.

#### **Prerequisites:**

### **CPTR2260 - Advanced Structured Query Language** ..... (3 credits)

Students will build upon the skills learned in the Structured Query Language (SQL) class. This course takes on more advanced but common operations such as joins and sub-queries, unions and intersections. Additional topics will include the use of stored procedures and views and appropriate use of these features, proper indexing of data, altering table definitions and use of the CASE statement.

#### **Prerequisites:**

### **CPTR2272 - Network Operating Systems** ..... (3 credits)

This course teaches the functions of a network operating system so the student can effectively maintain and manage a network. The student learns how to establish and oversee the operations of a network, create logins, design and establish directory structures and implement security.

#### **Prerequisites:**

### **CPTR2275 - Data Analytics** ..... (3 credits)

This course is an introduction to data analytics. The student will explore historical roots and reasons for business intelligence. The student will be introduced to big data, data mining and data warehousing and how they help businesses. Database scalability and optimization also will be covered.

#### **Prerequisites:**

**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:**

**HUM2236 - Technology in the Humanities** ..... (3 credits)  
 Meets MnTC Goal Areas 2, 6 and 8. Developments in the arts, architecture, science, philosophy and education and studies in human interaction are often provoked by changes in technology. Early changes in military technology made it possible for civilizations to take charge of various places on the world's stage. However, over time, changes in how the world was understood, motivated by general advances in global exploration, astronomy and other sciences as well as specific inventions such as movable type, proved even more instrumental in driving people to new and different understandings of what it means to be human. This course explores how technology impacts developments in a culture's world view and tries to anticipate how future changes in technology might alter the course of otherwise established ways of life.

**MATH1100 - World of Math** ..... (3 credits)  
 Meets MnTC Goal Areas 2 and 4. This course introduces mathematical approaches to question asking, understanding, problem solving and presentation. Students will apply mathematical principles to varied disciplines including an exploration of a variety of social and global issues. Students will experience mathematics as a creative and evolving discipline. Practice in these areas may include problems involving sequences, methods of counting, probability, logic, statistics, finance, general problem solving and other topics. This course is not intended to prepare students for any subsequent course. It provides an alternative pathway to completing a college-level liberal arts mathematics course and is not intended for science, technology, engineering or math (STEM) students.

**Prerequisites:**

**MATH1114 - College Algebra** ..... (4 credits)  
 Meets MnTC Goal Areas 2 and 4. This course includes rational, polynomial, exponential, logarithmic, inverse and quadratic functions. The course also includes equations, inequalities, complex numbers and systems of linear equations. Additional topics may include matrices and determinants.

**Prerequisites:**

**MATH1213 - Introduction to Statistics** ..... (4 credits)  
 Meets MnTC Goal Areas 2 and 4. Topics include data summary, frequency distributions, plots, graphs, measures of central tendency, variation, probabilities, probability distributions and confidence intervals. Hypothesis testing of means, proportions and variances will be conducted using the z-test, t-test, chisquare-test, f-test and ANOVA. Optional topics may include nonparametric statistics, sampling and simulation.

**Prerequisites:**

# INFORMATION TECHNOLOGY - DATABASE ADMINISTRATION

## ASSOCIATE OF APPLIED SCIENCE (AAS) - 60 CREDITS

Program Plan — "Primary"  
Locations: Moorhead, Online

### 1st Fall Term (15 credits)

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#### Courses

Course	Crds
CPTR1001 - Introduction To Programming and Scripting .....	3
CPTR1106 - Microcomputer Databases .....	3
CPTR1108 - CISCO 1 .....	3
CPTR1170 - Web Engineering I .....	3
MATH1100 - World of Math .....	3

### 1st Spring Term (17 credits)

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#### Courses

Course	Crds
CPTR2210 - Database Report Generation .....	3
CPTR2224 - Linux I .....	3
CPTR2230 - Structured Query Language .....	3
CSCI1121 - Computer Science I .....	4
MATH1114 - College Algebra .....	4

### 2nd Fall Term (16 credits)

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#### Courses

Course	Crds
CPTR2234 - Linux II .....	3
CPTR2260 - Advanced Structured Query Language .....	3
CPTR2272 - Network Operating Systems .....	3
HUM2236 - Technology in the Humanities .....	3
MATH1213 - Introduction to Statistics .....	4

### 2nd Spring Term (12 credits)

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#### Courses

Course	Crds
CPTR2240 - Database Administration .....	3
CPTR2245 - Enterprise Network Technologies .....	3
CPTR2275 - Data Analytics .....	3
ENGL1101 - College Writing .....	3