# COMPUTER TECHNOLOGY CERTIFICATE - 16 CREDITS

## OVERVIEW

### WHY CHOOSE A COMPUTER TECHNOLOGY CERTIFICATE?

This program will help train students with a broad range of skills useful in computer-based industries. The training received in this program will give students a good foundation in a number of high growth professions in the computer technology field.

### SKILLS ACQUIRED

*from iSeek.org*

Graduates in Computer Technology will be trained with a broad range of skills useful to computer-based industry applications including:

- Programming languages
- Structure of databases
- Logical organization of computer systems
- Use of standard desktop applications

## CAREERS IN COMPUTER TECHNOLOGY

### Projected Job Growth

Here is the projected job growth in the state of Minnesota for a variety of professions that use skills from computer technology *(according to iSeek.org)*:

<table>
<thead>
<tr>
<th>Profession</th>
<th>Projected Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employment of computer and information research scientists is projected to grow 14.9% through 2020.</td>
<td></td>
</tr>
<tr>
<td>Employment of network architects is projected to grow 11.3% through 2020.</td>
<td></td>
</tr>
<tr>
<td>Employment of computer programmers is projected to stay the same through 2020</td>
<td></td>
</tr>
<tr>
<td>Employment of computer support specialists is projected to grow 9.8% through 2020.</td>
<td></td>
</tr>
<tr>
<td>Employment of computer systems analysts is projected to grow 14.9% through 2020.</td>
<td></td>
</tr>
<tr>
<td>Employment of database administrators is projected to grow 21.7% through 2020.</td>
<td></td>
</tr>
<tr>
<td>Employment of information security analysts is projected to grow 11.3% through 2020.</td>
<td></td>
</tr>
<tr>
<td>Employment of network and computer systems administrators is projected to grow 16.6% through 2020</td>
<td></td>
</tr>
<tr>
<td>Employment of software developers is projected to grow 15.9% through 2020.</td>
<td></td>
</tr>
<tr>
<td>Employment of web developers is projected to grow 11.3% through 2020.</td>
<td></td>
</tr>
</tbody>
</table>

### Types of Jobs

*(Bureau of Labor Statistics)*

Individuals who study Computer Technology typically pursue careers as:

- Computer and Information Research Scientists
- Computer Network Architects
- Computer Programmers
- Computer Support Specialists
- Computer Systems Analysts
- Database Administrators
- Information Security Analysts
- Network and Computer Systems Administrators
- Software Developers
- Web Developers

### Average State Pay

According to iSeek.org, the median annual salary in the state of Minnesota for the following positions in computer technology is:

<table>
<thead>
<tr>
<th>Position</th>
<th>Median Annual Salary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computer and Information Research Scientists</td>
<td>$125,362 ($60.26 per hour)</td>
</tr>
<tr>
<td>Computer Network Architects</td>
<td>$87,297 ($41.57 per hour)</td>
</tr>
<tr>
<td>Computer Programmers</td>
<td>$73,611 ($35.39 per hour)</td>
</tr>
<tr>
<td>Computer Support Specialists</td>
<td>$48,360 ($23.25 per hour)</td>
</tr>
</tbody>
</table>
**Description**

The Computer Technology Department’s mission is to train students with a broad range of skills useful in computer-based industries. This is provided through high quality courses leading to the Associate of Applied Science in Computer Technology. Selected courses in the curriculum may also be appropriate for knowledge enhancement of computer professionals.

**CERTIFICATE IN COMPUTER TECHNOLOGY**

An Associate of Applied Science in Computer Technology

The AA also includes the Minnesota Transfer Curriculum (MnTC) and thus will ensure you have satisfied general education coursework for other Minnesota State Institutions and the University of Minnesota.

**REQUIREMENTS**

The Computer Technology certificate is a “fast-track” path acquiring computer technology skills. This curriculum will develop a student’s problem solving skills in computer architecture, database use and design, telecommunications, and beginning programming. The certificate encompasses learning of foundation skills for Information Technology (IT) professionals.

**REQUIRED COURSES: 16 CREDITS**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMT 1107</td>
<td>Introduction to Computer Technology</td>
<td>4</td>
</tr>
<tr>
<td>COMT 1173</td>
<td>PC Architecture Operation and Interface</td>
<td>3</td>
</tr>
<tr>
<td>COMT 1181</td>
<td>Database Management Systems</td>
<td>3</td>
</tr>
<tr>
<td>COMT 1184</td>
<td>Telecommunications</td>
<td>3</td>
</tr>
</tbody>
</table>

**COMPLETE ONE OF THE FOLLOWING COURSES:**

<table>
<thead>
<tr>
<th>Code</th>
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</tr>
</thead>
<tbody>
<tr>
<td>COMT 1182</td>
<td>Advanced Database with Crystal Reports</td>
<td>3</td>
</tr>
<tr>
<td>COMT 1260</td>
<td>Introduction to Visual Basic</td>
<td>3</td>
</tr>
</tbody>
</table>

These courses must be completed within the last seven years prior to completing the Computer Technology Certificate with or without Industry Certification.

**OTHER CERTIFICATE REQUIREMENTS**

- Earn a minimum cumulative grade point average (GPA) of 2.0 for college-level coursework (courses numbered 1000 and above) completed at Normandale.
- Earn at least one third of the required certificate credits from Normandale.

**COURSES**

**COMT 1173 PC ARCHITECTURE OPERATION AND INTERFACE | 3 CR**

**Prereq:** COMT 1107

Introductory course on the architecture of computers. Using the PC as a representative architecture, the primary components of the PC and their interfaces are examined. Function of the operating system and its interaction with the computer hardware. Must be completed within the last seven years prior to receiving the AAS degree or certificate in Computer Technology.

Credits: 3 Semesters: Spring

**COMT 1181 DATABASE MANAGEMENT SYSTEMS | 3 CR**

**Prereq:** COMT 1107

Various database models with emphasis on the relational model. Data relationships and attributes, the use of entity relationship diagrams, and data mapping operations. Must be completed within the last seven years prior to receiving the AAS degree or certificate in Computer Technology.

Credits: 3 Semesters: Fall

**COMT 1184 TELECOMMUNICATIONS | 3 CR**

**Prereq:** COMT 1107

Aspects of telecommunications such as network topology, standards, OSI model, media, modems, data compression, data security, and the Internet. Must be completed within the last seven years prior to receiving the AAS degree in Computer Technology.

Credits: 3 Semesters: Spring

**COMT 1205 INTRODUCTION TO VISUAL BASIC | 3 CR**

This course introduces the Visual Basic programming language through hands-on development of projects of increasing complexity as the student gains increased understanding of the language. The course will include forms, controls, menus, programming fundamentals, syntax, and file formats. Must be completed within the last seven years prior to receiving the AAS degree or certificate in Computer Technology.
COMT 1800 TOPICS IN COMPUTER TECHNOLOGY | 3 CR
Prereq: Topic-dependent
An examination of a special topic in computer technology intended for all interested students. Topics may include hardware structures of PCs, hardware/software interactions, structure of programming language, input/output. Topics courses do not satisfy goals of the Minnesota Transfer Curriculum.

Credits: 3

COMT 2186 MICROPROCESSORS AND DIGITAL LOGIC (LECTURE ONLY) | 3 CR
Prereq: COMT 1107, or COMT 1173, (C or higher)
Basic building blocks of digital logic—gates, flip-flops, shift registers. These building blocks are used to create more and more complex forms with the microprocessors being a programmable logic element. Comparison between hard-wired and software-based elements are developed as well. There is no laboratory and the prerequisite for NANO 1153 is waived. Must be completed within the last 7 years prior to receiving the AAS degree or certificate in Computer Technology.

Credits: 3 Semesters: Fall

COMT 2900 TOPICS IN COMPUTER TECHNOLOGY | 3 CR
Prereq: Topic-dependent
An examination of a special topic in computer technology intended for second-year students. Topics may include hardware structures of PCs, hardware/software interactions, structure of programming language, and input/output. Topics courses do not satisfy goals of the Minnesota Transfer Curriculum.

Credits: 3

CSCI 1111 INTRODUCTION TO PROGRAMMING IN C | 4 CR
Prereq: CSCI 1101
Problem solving using the C programming language. Topics will include the syntax of the language, operators and expressions, control structures, scoping rules, functions, parameter passing, arrays, strings, pointers, structures, type definitions, file handling, libraries.

Credits: 4 Semesters: Fall, Spring

MATH 1100 COLLEGE ALGEBRA | 4 CR
Prereq: MATH 0700, or eligible for MATH 1100 MnTC Goals: 4
This is a college-level algebra course that emphasizes properties of functions and their graphs. Linear, quadratic, polynomial, rational, exponential and logarithmic functions are covered. Other topics include solving equations and inequalities, and systems of equations and inequalities. This course also includes a basic introduction to right triangle trigonometry.

Credits: 4 Semesters: Fall, Spring