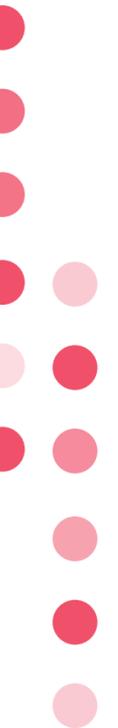
 tech  
careers

discover your future



TECHMB 



This booklet is a snapshot of Manitoba's tech community. Tech Manitoba consulted its network of local industry experts and educational institutions to source this material. There are many options and pathways that lead to a career in tech. This book serves to inspire curiosity to a career in tech and we encourage readers to research further and find the best route for your career.

# Table of Contents

How to Use This Book	3
About Tech Manitoba	4
Tech Careers in Scope	5
<b>Web Designers and Developers</b>	<b>6</b>
Multimedia Artists & Animators	7
Graphic Designers	7
Web Developers	8
<b>Software Engineers &amp; Designers</b>	<b>9</b>
Software Developers, Applications	10
Software Developers, Systems Software	10
<b>Computer Programmers &amp; Interactive Media Developers</b>	<b>11</b>
Computer Programmers	11
<b>Computer Engineers</b>	<b>12</b>
Electronics Engineers	13
Telecommunications Engineering Specialists	13
<b>Information Systems Analysts &amp; Consultants</b>	<b>14</b>
IT Project Manager	15
Cyber Defense Analysts	15
Computer Systems Architect	16
Computer Systems Analyst	16
Database Architects	17
Web Administrator	17
Business Intelligence Analysts	18
Software Quality Assurance Engineers	18
Search Engine Marketing Strategists	19
Nurse Specializing in Informatics	19
Video Game Designers	20
<b>Computer Network Administrators</b>	<b>21</b>
Network & Computer System Administrators	22
Computer Network Support Specialist	22
Resources	23
Acknowledgements	24

# How to use this book

This book highlights six different industry categories. The 'tech outlook' summarizes the booming careers in Manitoba. On the following pages, each category is then broken down further into the specialties. There you will find a description of the specialty including: skills & attributes, salary, potential employers and snapshot of work & tasks.

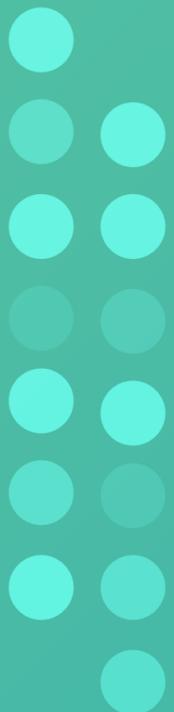
Category	Labour Demand	Total Employed in 2019	Projected Job Openings 2020-2024	Specialty
Web Designers & Developers	Competitive	573	100	<ul style="list-style-type: none"> <li>Multimedia Artists &amp; Animators</li> <li>Graphic Designers</li> <li>Web Developers</li> </ul>
Software Engineers & Designers	Competitive	621	100	<ul style="list-style-type: none"> <li>Software Developer, Applications</li> <li>Software Developer, Systems Software</li> </ul>
Computer Programmers & Interactive Media Developers	High Demand/ Growth	2391	350	<ul style="list-style-type: none"> <li>Computer Programmers</li> </ul>
Computer Engineers	Competitive	409	100	<ul style="list-style-type: none"> <li>Electronics Engineer</li> <li>Telecommunications Engineering Specialist</li> </ul>
Information Systems Analysts & Consultants	High Demand/ Growth	3321	500	<ul style="list-style-type: none"> <li>IT Project Manager</li> <li>Cyber Defense Analyst</li> <li>Computer Systems Architect</li> <li>Computer Systems Analyst</li> </ul>
Computer Network Technicians	High Demand/ Growth	2125	300	<ul style="list-style-type: none"> <li>Network &amp; Computer Systems Administrators</li> <li>Computer Network Support Specialist</li> </ul>



# About Tech Manitoba

Tech Manitoba represents the province's growing tech sector. We are an industry-led association that helps companies thrive and grow through collaboration, education and promotion. We bring people together to share skills, explore ideas and build a strong community. Through programming, events, and building connections at a local, national and international level, we aim to stimulate economic growth in Manitoba, be the trusted voice of Manitoba's tech sector and foster a culture where members thrive and grow.

Learn more about Tech Manitoba at:  
[techmanitoba.ca](https://techmanitoba.ca)



# Tech Careers in Scope

By 2021, the Information Communications Technology Council (ICTC) estimates approximately 216,000 Canadian tech jobs will need to be filled. When considering a career in the technology field, know that the options are rich and unlimited.

## Hard & Soft Skills, Traits, & Abilities

Many tech roles require hard skills that are needed to perform the required duties of the job. These are often earned through formal education programs and training. Hard skills are learned, defined, evaluated, and measured. Examples include computer programming, web design, analytics, science, software development, data, and math.

However, tech careers are not only represented by these abilities. Soft skills play a major part in many tech roles. These skills include creative thinking and writing, problem-solving, collaboration, drawing and painting, the know-how to budget, and the ability to direct and manage people.

Ultimately, there are many skills, character traits, and personal abilities that make a person suitable for tech. Using tools like this booklet is a useful way to start exploring which careers are best suited to you.

## What Industry Interests You?

Technology is improving healthcare by making it more efficient and accessible. You can mine medical records and create drugs faster with AI algorithms. Augmented reality allows surgeons to reconstruct 3-dimensional tumors. This gives medical professionals an x-ray view and new perspective on how to destroy them.

Technicians and developers are creating automation and robotics that are revitalizing manufacturing. Education is being transformed by tech like in the Winnipeg-based tech school Pembina Trails Early College (PTEC). Students at PTEC are accelerating their learning and pathway into tech careers through an innovative, blended high school, post-secondary and work experience model.

The world of finance has even been nicknamed with the term 'Fintech' (Financial Technology). This refers to the software and technologies used by businesses to innovate financial services. Money transfers, investing, and loan management have become easier and more secure because of web developers, project managers, and analysts.

These are just some of the sectors that tech is revolutionizing. Software engineers are creating the next hot social app, video games are made by designers, you can get famous with your phone, online platforms have changed tourism, and the future holds self-driving cars. Whichever industry you are interested in, it's most likely being driven by tech.

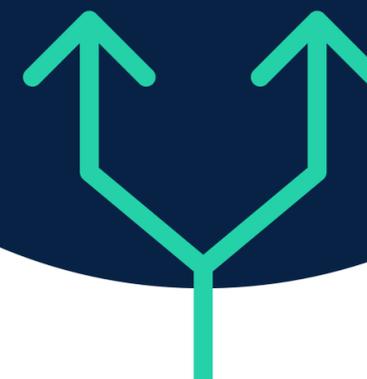
## Pathways

There are many pathways that can lead to a career in tech. Manitoba's universities offer two to five-year degrees. Our colleges fast-track education with one to two-year diplomas and include online learning options.

You can improve your skills through internet services and tutorials. Sign up for a coding boot camp or look for local tech meetups to attend. There is also a wealth of reading materials and podcasts where you can explore your interests and learn from tech people that you find compelling.

You can also reach out to a local start-up for some personal insight. They'll probably be thrilled to hear from you. There is a high demand for tech talent these days, and the pathways to educate people are as varied as the industry.

Our colleges fast-track education with one to two-year diplomas and include micro-credentialing and online learning options.



# Web Designers & Developers

A web developer is responsible for programming the code that instructs a website how to function. A web developer builds a website from the ground up, which means designing with the end user in mind, ensuring the function and navigation are streamlined. There are many different types of developers: Front-end, Back-end, Full Stack and JavaScript Developers, each with a different function and expertise. A web designer uses creativity and technical skill to build or redesign websites.

The web designer has the technical ability to make a website functional and easy to use, and make it aesthetically appealing to the user. A web designer's main job is to design web pages.

As we rely more and more on the internet for communications, information and shopping, the demand for web developers and designers has been growing rapidly. The web developer and designer industry is currently considered to have steady growth and competitive demand. Web design and development is an evolving and challenging industry in any of these roles, you must continue to learn, grow and adapt.





# Multimedia Artists & Animators

Multimedia artists and animators use technology to create graphics and animation for electronic media such as internet, film, television, and video games. This is a highly artistic position which requires intimate knowledge of the latest multimedia computer programs and software.



# Graphic Designers

Graphic designers use color, illustrations, fonts, and layout to visually communicate a message or present a product. They design logos, product packaging, print materials, and websites, among many other things. Graphic designers are found in a variety of industries and in different capacities.

### Potential employers:

- Video game development
- Software development
- Phone or web app development

### This career might be for you if you like or are good at:

- Creative thinking
- Paying attention to detail
- Drawing or painting
- Explaining your thought and creative process

### Kind of tasks and/or work activities:

- Create 2D and 3D images
- Design animation and movement
- Apply story development
- Plan scripts and narratives for the characters

### Education:

Bachelor's Degree in Computer Graphics, Art or Animation

### Potential employers:

- Video game development
- Software development
- Phone or web app development
- Freelance

### This career might be for you if you like or are good at:

- Creative thinking
- Paying attention to detail
- Drawing or painting
- Explaining your thought and creative process

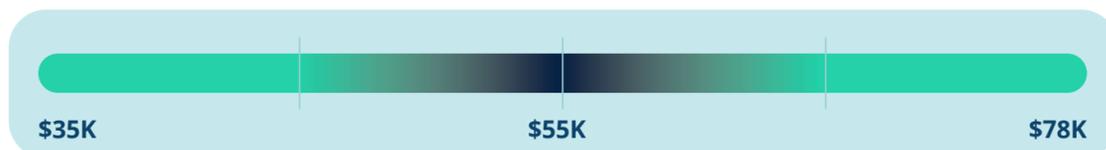
### Kind of tasks and/or work activities:

- Meet with clients about design ideas
- Create sample designs, concepts, and layouts
- Use computer software to create images

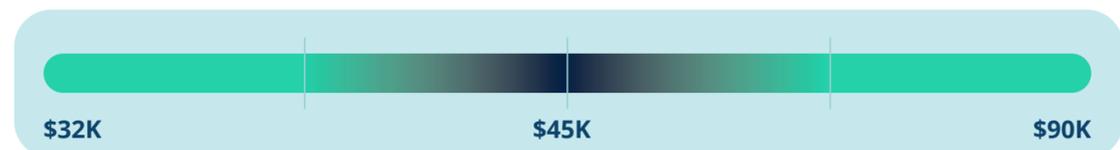
### Education:

College Diploma in Design or Graphic Design

Salary Ranges: \$35,000 – \$78,000



Salary Ranges: \$32,000 – \$90,000





# Web Developers

Web developers build the backbone of websites. Since web developers typically build websites from the ground up, they need to know relevant programming languages, such as JavaScript, HTML, and CSS. They may integrate websites with other computer applications.

## Potential employers:

- Marketing firms
- Phone or web app development
- Freelance

## This career might be for you if you like or are good at:

- Creative thinking
- Paying attention to detail
- Programming languages

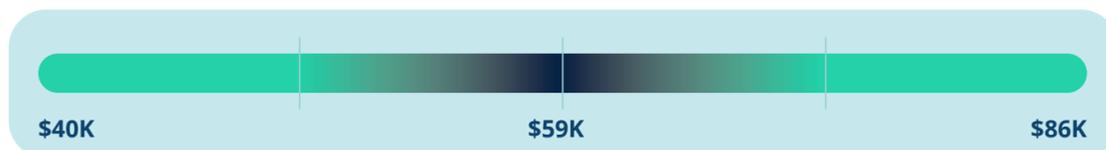
## Kind of tasks and/or work activities:

- Meet with clients about design ideas
- Create sample designs, concepts, and layouts
- Write, design, or edit web page content
- Write and test code to ensure the web page is usable
- Work with designers and content producers

## Education:

*Bachelor's Degree or Diploma in Computer Science or Computer Engineering*

**Salary Ranges:** \$40,000 – \$86,000



# Software Engineers & Designers



Software engineering is a branch of computer science which includes the development and building of computer systems software and applications software. Computer systems software is composed of programs that include computing utilities and operations systems. Applications software consists of user-focused programs that may include web browsers, and database programs.

Software Engineers have extensive knowledge of programming languages, software development, and computer operating systems, and they apply engineering principles to software creation. By applying these engineering principles to every stage of the development process, from requirements analysis to the software process, they can create customized systems for individual clients.

Software Designers use principles of science and mathematics to develop applications for multiple purposes. They might make games, operating systems and software programs. They figure out what a program should do based on user needs, then create and test it to ensure its functionality.

The increasing reliance on mobile technology, venture capital-backed start-ups, growing complexity of technology and emerging industries have resulted in a high demand of skilled and qualified software engineers and designers.





## Software Developers, Applications

Software developers develop computer applications that allow users to perform specific tasks on computers or other devices. They may also develop or customize existing systems that run devices or control networks. They must be able to convey technical information in a language that is understood by non-technical people.

### Potential employers:

- Software development
- IT support providers

### This career might be for you if you like or are good at:

- Paying attention to detail
- Programming languages
- Working on a team

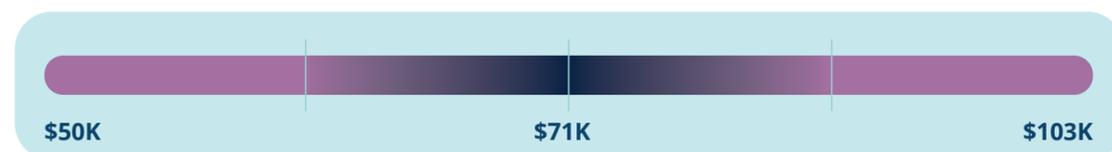
### Kind of tasks and/or work activities:

- Write code to create applications
- Write, modify, and debug software for client applications
- Training users
- Identifying areas for modification in existing programs

### Education:

*Bachelor's Degree or Diploma in Software Development or Computer Science*

**Salary Ranges:** \$50,000 – \$103,000



## Software Developers, Systems Software

Software developers of systems software are specialized software engineers that help develop new systems and platforms, as well as maintain and update existing platforms to meet the needs of the marketplace and/or employer. This software forms a framework for businesses and organizations on which other activities can be performed.

### Potential employers:

- Software development
- IT support providers

### This career might be for you if you like or are good at:

- Paying attention to detail
- Programming languages
- Working on a team

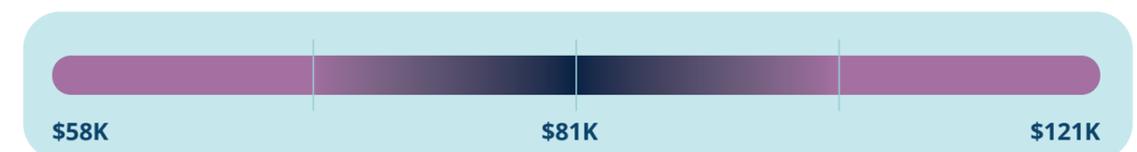
### Kind of tasks and/or work activities:

- Write code
- Consult with customers
- Research, design, develop, and test operating systems-level software
- Identifying areas for modification in existing programs

### Education:

*Bachelor's Degree or Diploma in Computer Science, Computer Systems Engineering, or Software Engineering*

**Salary Ranges:** \$58,000 – \$121,000



# Computer Programmers & Interactive Media Developers



## Computer Programmers

Computer Programmers take designs created by software developers and engineers and turn them into sets of instructions that computers can follow. They code computer software and write, design, debug, troubleshoot, and maintain source code related to various computer programs. They also ensure that all source code is written in programming languages that can be understood by the computer so that programs can then be used by end-users.

### Potential employers:

- Software development
- IT support providers

### This career might be for you if you like or are good at:

- Programming languages
- Paying attention to detail
- Written and verbal communication
- Mathematics

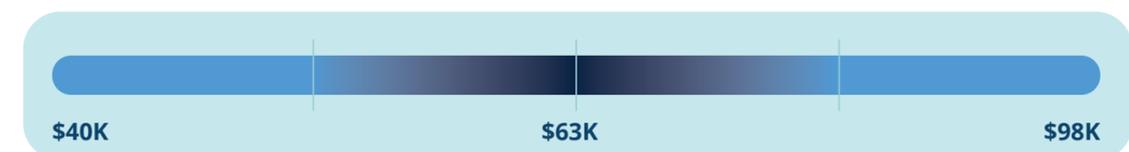
### Kind of tasks and/or work activities:

- Write, modify, and debug software for server applications
- Write code to create multi-threaded, networked server applications
- Test and document software for server applications
- Correct errors by making appropriate changes and rechecking the program

### Education:

*Bachelor's Degree in Computer Science*

**Salary Ranges:** \$40,000 – \$98,000

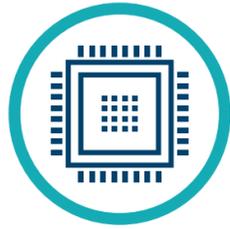


# Computer Engineers

**Your cell phone. Your DVR, Your computer. Your Gaming Device.**  
All of these technologies and devices exist because  
of Computer Engineers.

Computer engineering is a branch of engineering that integrates several fields of computer science and electronic engineering required to develop computer hardware and software. Computer engineers usually have training in electronic engineering, software design, and hardware-software integration. Computer engineers are involved in many hardware and software aspects of computing, including microcontrollers, microprocessors, personal computers, and circuit design. This field of engineering not only focuses on how computer systems work but also how they integrate into the larger picture.





# Electronics Engineers

Electrical engineering is a broad specialization of the engineering discipline that pertains to the various practical aspects of electronic systems. These professionals are called upon to design a wide field of hardware and software, provide technical support, inspect electronic equipment for efficient operation and compliance with safety codes, and to prepare documentation regarding technical details of electronic equipment.

### Potential employers:

- Manufacturing
- Telecommunications
- Finance

### This career might be for you if you like or are good at:

- Critical thinking
- Mathematics
- Problem solving

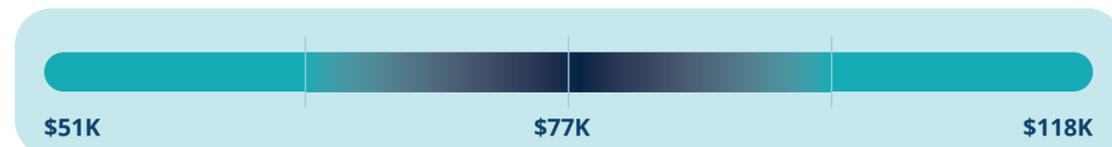
### Education:

*Bachelor's Degree in Electrical Engineering or Technology Diploma*

### Kind of tasks and/or work activities:

- Design electronic components, software, products, or systems for commercial, industrial, medical, military, or scientific applications
- Analyze customer needs and determine electrical system requirements, capacity, and cost to develop a system plan
- Develop maintenance and testing procedures for electronic components and equipment
- Inspect electronic equipment, instruments, and systems to make sure they meet safety standards and applicable regulation

**Salary Ranges:** \$51,000 – \$118,000



# Telecommunications Engineering Specialists

Telecommunications engineering specialists oversee a variety of electronic communication media, typically supervising and working with a telecommunications or information technology (IT) department. They ensure that all the ways the organization communicates (such as company email, company phones and phone lines, and video-conferencing software and hardware) operate properly and at maximum efficiency. They may help to establish organization rules for company-issued equipment and must ensure that all software and security measures are up-to-date and installed properly.

### Potential employers:

- IT support providers
- Telecommunications
- Finance

### This career might be for you if you like or are good at:

- Mathematics
- Communicating clearly with others
- Critical thinking

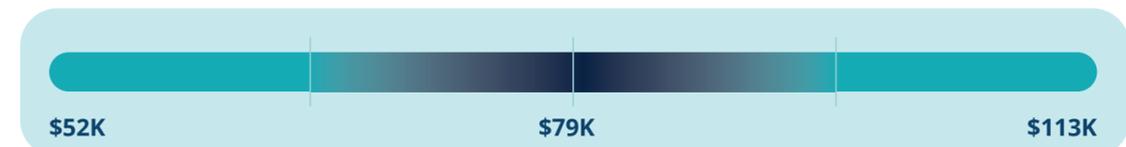
### Education:

*Bachelor's Degree or Diploma in Electronic Engineering, Wireless Systems Engineering, Telecommunication Engineering*

### Kind of tasks and/or work activities:

- Design, develop and test telecommunications software solutions
- Review, analyze, evaluate and maintain an organization's telecommunications system
- Train customers in telecommunications features and functionality
- Install, maintain, troubleshoot and repair telecommunications systems
- Examine new services offered by vendors and makes recommendations to management

**Salary Ranges:** \$52,000 – \$113,000



# Information Systems Analysts & Consultants



A systems analyst is a person who uses analysis and design techniques to solve business problems using information technology. Systems analysts may serve as change agents who identify the organizational improvements needed, design systems to implement those changes, and train and motivate others to use the systems. System consulting is a business activity that helps corporations review operating processes and information technology mechanisms, ensuring that such processes are adequate and functional. System consultants help firms improve process adequacy and functionality.

The variety of skills, expertise and growing technology has resulted in a high demand for IT Analysts & Consultants. Every business uses technology, regardless of sector which makes the Information Systems Analysts & Consultants industry a rapidly growing industry.





# IT Project Manager

IT Project Managers plan, initiate, and manage information technology (IT) projects. They lead and guide the work of technical staff and serve as the point of contact between business and the technical aspects of projects. Additionally, they plan project stages and monitor progress to ensure deadlines, standards and cost targets are met.

### Potential employers:

- Finance
- Healthcare
- Insurance
- IT Support Providers
- Manufacturing

### This career might be for you if you like or are good at:

- Developing large plans
- Directing and managing people
- Communicating with people
- Mathematics and budgeting
- Scheduling

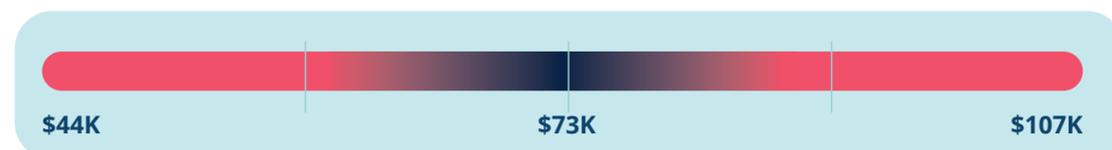
### Kind of tasks and/or work activities:

- Manage entire project execution
- Develop and update project plans
- Communicate with staff working on the project
- Assign duties and responsibilities
- Monitor and manage project budget

### Education:

*Bachelor's degree or College Diploma (within IT field)*

**Salary Ranges:** \$44,000 – \$107,000



# Cyber Defense Analysts

Cyber Defense Analysts monitor computer networks for security issues. They investigate security breaches and other cyber security incidents. Additionally, they install security measures and operate software to protect systems and information infrastructure, including firewalls and data encryption programs.

### Potential employers:

- Finance
- Insurance
- IT Support Providers

### This career might be for you if you like or are good at:

- Finding problems or identifying potential problems
- Listening to others and discussing their security issues
- Deductive reasoning
- Focusing on one task for a long period of time without being distracted
- Mathematical reasoning

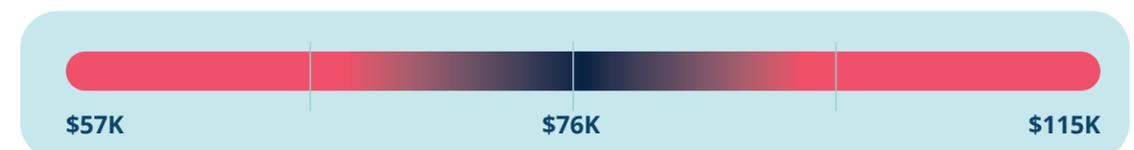
### Kind of tasks and/or work activities:

- Develop plans to safeguard computer files
- Encrypt data transmissions and erect firewalls
- Assess risk and test data processing systems
- Train users and promote security awareness

### Education:

*Bachelor's Degree or College Diploma (within IT field)*

**Salary Ranges:** \$57,000 – \$115,000





# Computer Systems Architect

Computer Systems Architects design, configure, operate and perform maintenance on networking and computer systems — including hardware, software, web portals, internet and intranet connections, firewalls, servers, and security.

### Potential employers:

- IT Support Providers
- IT System Consultants
- Freelance

### This career might be for you if you like or are good at:

- Discussing computer systems with people
- Providing advice
- Designing plans with clear instructions and guidelines
- Collaborating with others
- Creative thinking

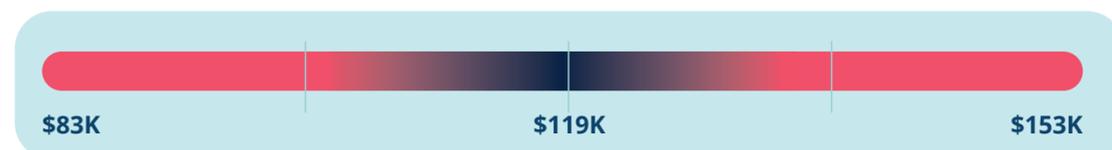
### Kind of tasks and/or work activities:

- Working with clients to create a customized computer system
- Analyze user requirements to design and develop system architecture and specifications
- Lead the research and development of new software products and applications
- Conceive, design, prototype, and test new methods, algorithms, and models

### Education:

*Bachelor's Degree in Computer Science*

**Salary Ranges:** \$83,000 – \$153,000



# Computer Systems Analyst

Computer Systems Analysts use computers and related systems to automate functions and integrate them into distributing, manufacturing, sales, and other related functions. These analysts look at what a business unit or organization is attempting to do and then figure out how to use computer technology to streamline and automate those processes to achieve maximum accuracy and efficiency.

### Potential employers:

- IT Support Providers
- IT System Consultants
- Insurance
- Finance

### This career might be for you if you like or are good at:

- Teaching or training peers
- Deductive reasoning
- Paying attention to detail
- Problem solving
- Creative thinking

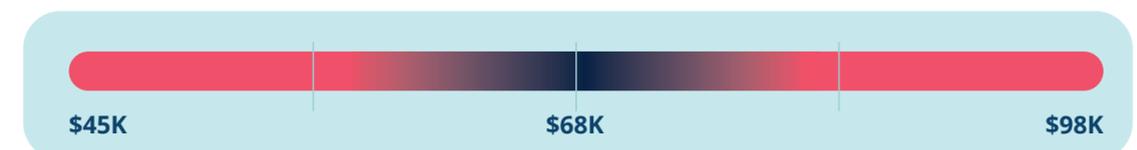
### Kind of tasks and/or work activities:

- Monitor network and systems for performance, security, and other issues
- Recommend, install, configure, maintain, and upgrade all computer and networking software and hardware
- Assist users with software, hardware, and connectivity issues
- Install, configure, maintain, upgrade, and troubleshoot file, email, as well as Internet access and other networked services

### Education:

*College Diploma, or Bachelor's Degree in Computer Science*

**Salary Ranges:** \$45,000 – \$98,000





## Database Architects

Database architects are responsible for designing, implementing, and testing database features for their organization. They oversee developing innovative database solutions that increase company productivity and minimize downtime. Their main responsibilities include maintaining database and automated processes and interacting with other information technology specialists, sharing important information related to database concerns and constraints.

### Potential employers:

- IT Support Providers
- IT System Consultants
- Insurance
- Finance

### This career might be for you if you like or are good at:

- Critical thinking
- Problem solving
- Working with others on a team
- Paying attention to detail

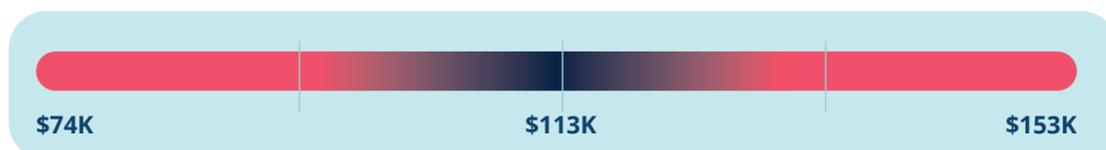
### Kind of tasks and/or work activities:

- Develop, design, and document database architectures
- Collaborate on a team
- Create and enforce database development standards
- Identify, evaluate, and recommend hardware or software technologies
- Set up backup or recovery processes

### Education:

*Bachelor's Degree in Computer Science or Engineering*

Salary Ranges: \$74,000 – \$153,000



## Web Administrator

Web administrators - also called webmasters, web architects, and web developers - are responsible for maintaining and updating their company's website or websites. They help ensure websites are user friendly and offer an optimal user experience. Some day-to-day responsibilities of a web administrator might include developing intranet solutions, migrating legacy software, and solving any web problems that may arise.

### Potential employers:

- IT Support Providers
- E-Commerce
- Freelance

### This career might be for you if you like or are good at:

- Finding problems or identifying potential problems
- Focusing on one task for a long period of time without being distracted
- Following web/online platform trends
- Paying attention to detail

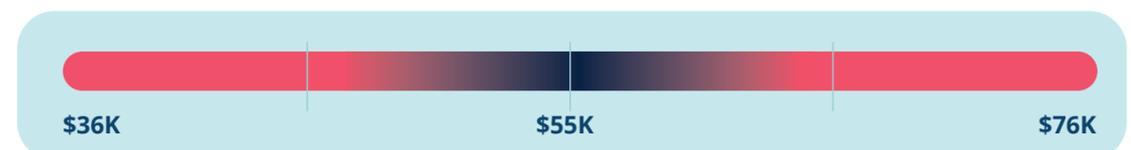
### Kind of tasks and/or work activities:

- Determine sources of web page or server problems
- Review or update web page content or links in a timely manner
- Implement web site security measures, such as firewalls or message encryption
- Administer internet/intranet infrastructure, including web, file, and mail servers
- Test backup or recovery plans regularly and resolve any problems

### Education:

*Diploma in Web Development or Post-secondary Certificate Degree*

Salary Ranges: \$36,000 – \$76,000





# Business Intelligence Analysts

Business intelligence (BI) analysts help guide and improve the way that a businesses' management fosters collaboration within and between departments. BI Analysts understand how data is turned into information and knowledge and how that knowledge supports and enables key business processes.

### Potential employers:

- Manufacturers
- Consulting firms
- Finance

### This career might be for you if you like or are good at:

- Understanding the needs of those around you
- Critical thinking
- Interacting directly with others
- Mathematics and developing formulas

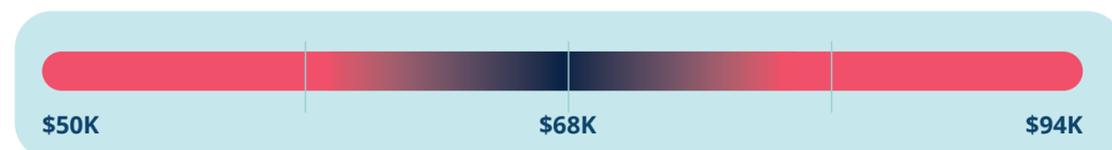
### Kind of tasks and/or work activities:

- Extract data from databases and data warehouses for reporting and to facilitate sharing between multiple data systems
- Identify and analyze industry trends
- Generate custom or standard reports summarizing business, financial, or economic data
- Ensure data quality and validity best practices are in place and followed

### Education:

*Bachelor's Degree in Business & Economics, Computer Science*

**Salary Ranges:** \$50,000 – \$94,000



# Software Quality Assurance Engineers

Software quality assurance (SQA) engineers and testers oversee controlling standards in the software developing process. They carefully plan product specifications and features, and they ensure applications are tested and ship without bugs or technical glitches. Among their main responsibilities, SQA engineers and testers manage software performance and stress-test code to improve reliability.

### Potential employers:

- Software development
- Video game development
- Phone or web app development

### This career might be for you if you like or are good at:

- Identifying problems
- Programming languages
- Planning strategies

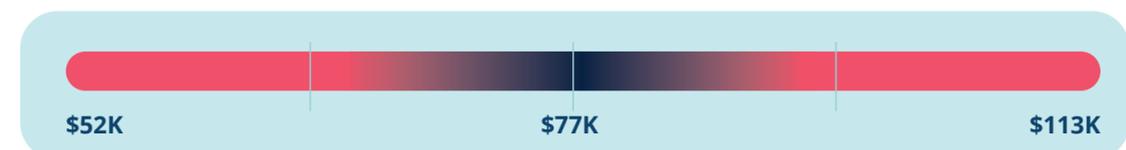
### Kind of tasks and/or work activities:

- Participate in product design reviews and modify requirements
- Document, track, and resolve software bugs or defects with help from the programming team
- Staying up to date with new testing tools and test strategies

### Education:

*Bachelor's Degree in Computer Science*

**Salary Ranges:** \$52,000 – \$113,000





## Search Engine Marketing Strategists

Search engine marketing strategists analyze and develop search engine marketing campaigns. They work with analytics platforms such as Google Analytics to see how a website is performing and what is driving traffic to that website. Then, they collaborate with managers, content creators, and web developers to increase the website's rank on search engines.

### Potential employers:

- Marketing firms
- Website design firms
- Freelance

### This career might be for you if you like or are good at:

- Creative thinking
- Communicating clearly with others
- Observing and obtaining information
- Influencing others

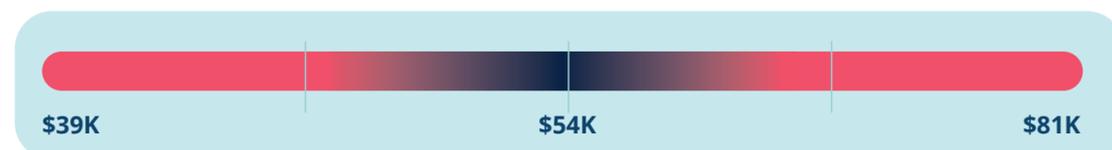
### Kind of tasks and/or work activities:

- Work to build links with other websites and may handle pay per click (PPC) advertising
- Optimize tools for tracking website visitor's behavior
- Conduct online marketing initiatives such as paid ad placement
- Enhance website exposure

### Education:

*Bachelor's Degree in Marketing*

**Salary Ranges:** \$39,000 – \$81,000



## Nurse Specializing in Informatics

The informatics nurse uses clinical nursing experience to optimize the use and function of electronic medical records and patient care software applications. This type of nurse is responsible for identifying and supporting computerization needs related to patient care services and serves as a liaison among medical clinical staff and computer and software vendors.

### Potential employers:

- Healthcare

### This career might be for you if you like or are good at:

- Communicating clearly with others
- Observing and obtaining information
- Developing creative solutions
- Improving processes

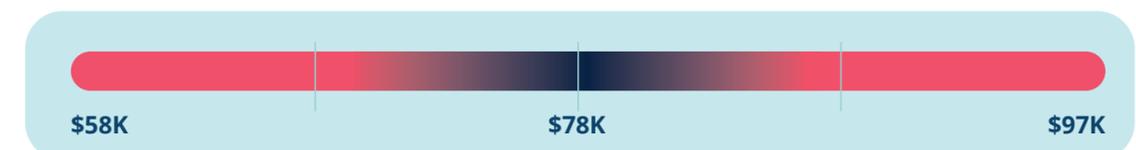
### Kind of tasks and/or work activities:

- Maintain medical hardware and software
- Troubleshoot system problems
- Customize software per individual user preferences
- Perform system updates and upgrades
- Run reports and collecting data as needed

### Education:

*Bachelor's Degree in Nursing with combined experience*

**Salary Ranges:** \$58,000 – \$97,000





# Video Game Designers

Video game designers generally work to code programs on various platforms (such as computers and gaming systems) to create playable games. Creating a game involves creating a concept and storyline and mapping it out for others on the game design team so they can help with development. Designers generally work with a flowchart when creating a game's storyboard.

## Potential employers:

- Software development
- Video game development
- Phone or web app development

## This career might be for you if you like or are good at:

- Creative thinking
- Creative writing
- Programming languages
- Puzzles

## Kind of tasks and/or work activities:

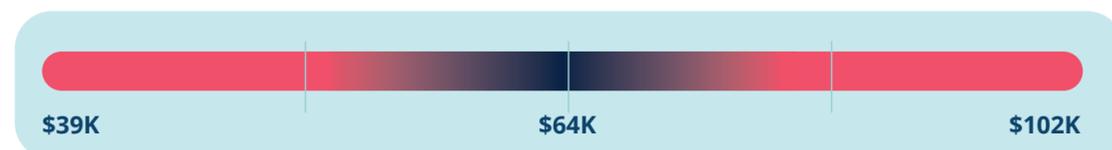
- Drive game design through conceptualization, presentation, implementation, tuning, and release
- Assist in design of user interface screens, support screens, and game levels
- Conceptualize and implement game mechanics, animation, characters, narrative, assets, AI behaviors, text, and sound
- Work collaboratively on a team

## Education:

*College Diploma*



**Salary Ranges:** \$39,000 – \$102,000



# Computer Network Administrators

Network and computer systems administrators oversee the day-to-day operations of networks, including organization and installation. From non-profits to community colleges, all businesses need their servers, networks, and internet always running.

A computer systems administrator maintains an organization's work flow and keeps its lines of communication open. They are responsible for the upkeep, configuration, and reliable operation of computer systems.

In addition to identifying and fixing network issues, computer systems administrators must also make updates to all equipment and software so they're current.





# Network & Computer System Administrators

Network and computer system administrators oversee administrating and managing network-related tasks across systems in their organization. They are responsible for maintaining excellent network transfer performance, as well as oversee and review networking protocols while developing new scripts to make networking devices work in more efficient ways.

### Potential employers:

- Manufacturing
- Telecommunications
- Software companies
- IT support provider

### This career might be for you if you like or are good at:

- Working on a team
- Self-managing
- Observing & obtaining information
- Identifying potential problems

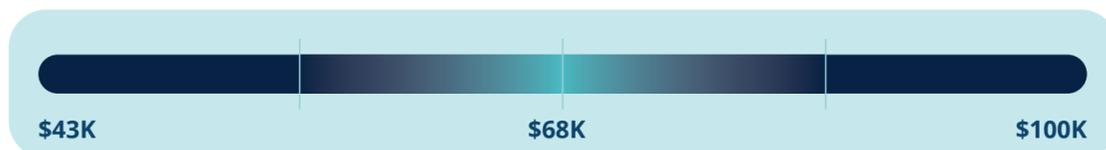
### Kind of tasks and/or work activities:

- Monitor network and systems for performance, security, and other issues
- Recommend, install, configure, maintain, and upgrade computer and networking software and hardware
- Establish and document standards and procedures

### Education:

*College Diploma*

**Salary Ranges:** \$43,000 – \$100,000



# Computer Network Support Specialist

A network specialist works in a company's information technology (IT) department to ensure constant connectivity. The network specialist makes sure that employees who rely on a company intranet can communicate with one another. For companies that rely on an internet presence with customers, the network specialist also always ensures that the company's website and e-commerce infrastructure work.

### Potential employers:

- Telecommunications
- Broadcasting
- IT support provider

### This career might be for you if you like or are good at:

- Working on a team
- Analyzing information
- Identifying potential problems
- Puzzles

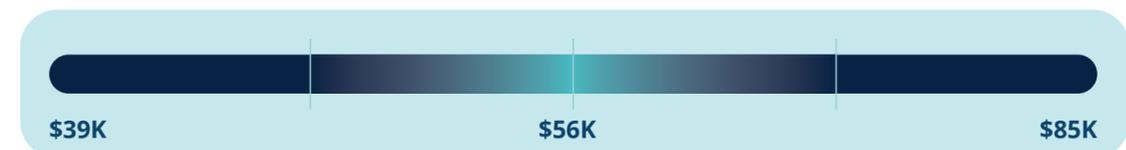
### Kind of tasks and/or work activities:

- Administrate and setup of all user accounts to access the network
- Setup and support all network equipment including servers, PC's, printers, and LAN equipment
- Maintain daily and monthly backups of servers ensuring data integrity
- Identify the causes of networking problems for users

### Education:

*Bachelor's Degree in Computer Science*

**Salary Ranges:** \$39,000 – \$85,000



# Resources

Post-Secondary Institution	Program
 <p>MANITOBA INSTITUTE OF TRADES &amp; TECHNOLOGY</p> <p>mitt.ca</p>	<p>Cyber Defence &amp; Cloud Administration Diploma   <b>2 Year</b></p> <p>Network &amp; Computer Technology   <b>1 Year</b></p> <p>Network Security Diploma   <b>13 Months</b></p> <p>Software Developer   <b>1 Year</b></p>
 <p>ROBERTSON</p> <p>robertsoncollege.com</p>	<p>Computer Support Technician Diploma   <b>24 Weeks</b></p> <p>Network Security Technician Diploma   <b>49 Weeks</b></p> <p>Network Systems Administrator   <b>48 Weeks</b></p> <p>Full Stack Web Developer   <b>37 Weeks</b></p>
 <p>University of Manitoba</p> <p>umanitoba.ca</p>	<p>Computer Engineering   <b>4 or 5-Year Option</b> Specializing in Digital Logic, Discrete Mathematics, Electronics, Microprocessors, Operating Systems, and Software Engineering</p> <p>Computer Science   <b>4 or 5-Year Option</b> Specializing in Software Engineering, Databases, Human-Computer Interaction &amp; Computer Graphics, AI, Network and Security, Computer Systems, and Theoretical Computer Science</p>
 <p>Université de Saint-Boniface</p> <p>ustboniface.ca</p>	<p>Multimedia Communication   <b>2 Years</b> Webmaster, Graphic Designer</p> <p>Computer Science   <b>2 Years</b> Specializing in Computer System Analysis and Design, System Installation and Management, Computer Project Management and Consulting</p>

Post-Secondary Institution	Program
 <p>RED RIVER COLLEGE</p> <p>rrc.ca</p>	<p>Business Information Technology   <b>2 Years</b></p> <p>Business Technology Management   <b>2 Years</b></p> <p>Information Security   <b>20 Month Post-Graduate</b></p> <p>Network Services Technician   <b>1 Year</b></p> <p>Online Courses: Cisco Networks CCNA, Software Development, Information Systems Programmer Analyst</p>
 <p>ASSINIBOINE COMMUNITY COLLEGE</p> <p>assiniboine.net</p>	<p>Communications Engineering Technology   <b>2 Years</b></p> <p>Interactive Media Arts   <b>2 Years</b></p> <p>Network Administration Technology   <b>2 Years</b></p> <p>Geographic Information Systems - GIS   <b>1 Year</b></p>
 <p>THE UNIVERSITY OF WINNIPEG</p> <p>uwinnipeg.ca</p>	<p>Applied Computer Science   <b>3 Year, 4 Year,</b> or Honours Bachelor of Science Applied Science, Information Systems, Health Informatics</p> <p>PACE (Professional, Applied and Continuing Education)</p> <p>Network Security Diploma   <b>16 Months</b></p> <p>Web Development Diploma   <b>1 Year</b></p>

# Acknowledgements

Tech Manitoba would like to thank the tech community and partners who contributed to the development of this career booklet. A special thanks to Tech Manitoba members Decision Works and Online Business Systems for their consultation.

## Occupational Information Provided by:

Greg Miles, M.A. (Economics), PMP  
Labour Market Information Specialist

## Sources:

Salary insights: [www.Payscale.ca](http://www.Payscale.ca)

