IT SOFTWARE DEVELOPER

Associate in Applied Science (AAS)
Program Code: 10-152-1
Total Credits: 63

Graduates of Mid-State's IT Software Developer program have the skills needed to design, develop, and maintain software and software systems on a wide variety of computing devices and to meet the spectrum of business needs. You'll learn to create software to run on all platforms including network servers, desktop workstations, web pages, and mobile devices. You will use state-of-the-art equipment and work in teams to design, develop, test, and implement small-scale software systems for nonprofit organizations and actual clients.

To learn more about this program, visit **mstc.edu/programs**.

ACADEMIC ADVISOR

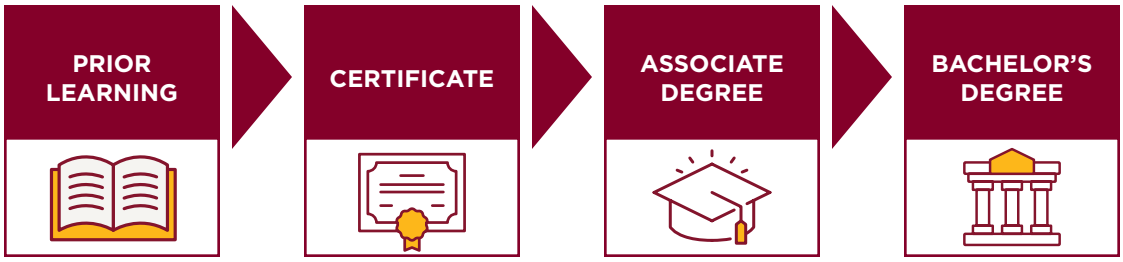
To schedule an appointment with an academic advisor, call 715-422-5300. Academic advisors will travel to other campuses as necessary to accommodate student needs. For more information about advising, visit **mstc.edu/advising.**

NEW STUDENT CHECKLIST

Complete the following steps to prepare for your New Student Advising appointment with your academic advisor:

- Submit a Mid-State application at **mstc.edu/apply**.
- Send official transcripts to:
  Mid-State Technical College
  Student Services
  500 32nd Street North
  Wisconsin Rapids, WI 54494
- Complete the Free Application for Federal Student Aid (FAFSA) at **fafsa.gov**. Mid-State's Financial Aid team is available to assist with your FAFSA application and to answer your financial aid questions. Contact Financial Aid or schedule an appointment at **mstc.edu/financial-aid**.
- Set up student MyCampus account at **mstc.edu/mycampus-assistance**.
- Schedule a New Student Advising appointment at **mstc.edu/advising**.

CAREER PATHWAY



Career pathways help you build your education step by step. Each stage offers one or more credentials that are recognized by employers and lead to real jobs—and you can keep building toward your career goals as you go.

Begin at any point.

Prior Learning

Credit for Prior Learning

- Certifications and Licenses
- Military Experience
- National/Standardized Exams
- Transfer Credit
- Work and Life Experience

Learn about Credit for Prior Learning at **mstc.edu/cpl**.

High School Credit

- High School Dual Credit
- Mid-State Fast Track

Learn about High School Credit at **mstc.edu/dc**.

Certificate

- Fundamentals of Programming (9 Credits)

Associate Degree

- IT Software Developer (63 Credits)
  Start Your Career: Full-Stack Developer, Programmer/Analyst, Software Developer, Software Engineer, Web Developer

Bachelor's Degree

For those interested in continuing their education, Mid-State offers transfer guides with various four-year colleges and universities. For more information, visit **mstc.edu/transfer**.

Other Options

Related Programs: IT Network Specialist, IT Cybersecurity Specialist, IT User Support Technician

OUTCOMES

Employers will expect you, as an IT Software Developer graduate, to be able to:

- Design software systems.
- Implement a team-based software development methodology.
- Navigate in a software development environment.
- Integrate data technologies.
- Develop software applications.
- Develop technical documentation.

TECHNICAL SKILLS ATTAINMENT

The Wisconsin Technical College System (WTCS) has implemented a requirement that all technical colleges measure outcomes attained by students. This requirement is called Technical Skills Attainment (TSA). The main objective of TSA is to ensure graduates have the technical skills needed by employers. Faculty will let students know when and how the TSA is being assessed in the program.

STUDENT HANDBOOK

Visit **mstc.edu/studenthandbook** to view Mid-State's student handbook, which contains information about admissions, enrollment, appeals processes, services for people with disabilities, financial aid, graduation, privacy, Mid-State's Student Code of Conduct, and technology.

GRADUATION REQUIREMENT

The GPS for Student Success course is required for all Mid-State program students and is recommended to be completed before obtaining 12 credits. Some students are exempt from this requirement. Please see your academic advisor for more information.

ADDITIONAL COURSES AS NEEDED

The following courses may be recommended or required if the student does not achieve minimum placement scores.

College Reading and Writing 1
10831104
3 credits
Provides learners with opportunities to develop and expand reading and writing skills to prepare for college-level academic work. Students will employ critical reading strategies to improve comprehension, analysis, and retention of texts. Students will apply the writing process to produce well-developed, coherent, and unified written work.

Pre-Algebra
10834109
3 credits
Provides an introduction to algebra. Includes operations on real numbers, solving linear equations, percent and proportion, and an introduction to polynomials and statistics. Prepares students for elementary algebra and subsequent algebra-related courses.

MULTIPLE MEASURES

Students can place into courses using high school GPA and completed classes. Placement can be determined in the following ways:

- **Multiple Measures Writing (MMW)**
  High school GPA of 2.6 & successful completion of 2.0 credits of high school writing courses with a "C" or better
- **Multiple Measures Reading (MMR)**
  High school GPA of 2.6 & successful completion of 2.0 credits of high school literature courses with a "C" or better
- **Multiple Measures Math 1 (MMM_1)**
  High school GPA of 2.6 & successful completion of 1.0 credit of high school math (Algebra 1 or equivalent) with a "C" or better
- **Multiple Measures Math 2 (MMM_2)**
  High school GPA of 2.6 & successful completion of 2.0 credits of high school math including Algebra 1 and Algebra 2 with a "C" or better
- **Multiple Measures Science 1 (MMS_1)**
  High school GPA of 2.6 & successful completion of 1.0 credit of high school lab science course with a "C" or better
- **Multiple Measures Science 2 (MMS_2)**
  High school GPA of 2.6 & successful completion of 1.0 credit of high school chemistry with a "C" or better

Past high school and college transcripts are used in making course placement decisions.

SAMPLE FULL-TIME CURRICULUM OPTION

IT Software Developer • 63 Total Credits

Term 18 Credits

Course Number	Course Name	CPL	Credits
10152101	Intro to Programming	Yes	3
10152121	Object-Oriented Programming 1	Yes	3
10152150	Web Design 1	Yes	3
10152178	Intro to Artificial Intelligence	No	1
10801196	Quantitative Reasoning	Yes	3
10152103	IT Exploration	Yes	1
10801195 or 10801136	Written Communication or English Composition 1	Yes	3
10890102	GPS for Student Success	Yes	1

Term 15 Credits

Course Number	Course Name	CPL	Credits
10152122	Object-Oriented Programming 2	No	3
10152159	User Experience Design	No	3
10152174	Collaborative Application Development	Yes	3
10156101	Database Concepts and Design	No	3
10801196 or 10801198	Oral/Interpersonal Communication or Speech	Yes	3

Term 15 Credits

Course Number	Course Name	CPL	Credits
10152155	Web Programming 1	No	3
10152160	Introductory Mobile Application Development	No	3
10152175	Software Architecture	No	3
10156102	SQL Development	No	3
10801197	Technical Reporting	No	3

Term 15 Credits

Course Number	Course Name	CPL	Credits
10151162	Secure Software Applications	No	3
10152158	Web Programming 2	No	3
10152176	Application Development Capstone	No	3
10809166	Introduction to Ethics: Theory & Application	Yes	3
10809198 or 10809188	Introduction to Psychology or Developmental Psychology	Yes	3

Please Note

- Credit for Prior Learning (CPL) options are available for some courses. You can visit **mstc.edu/cpl** or contact your academic advisor for details.
- This curriculum sequence is only for student planning. Actual student schedules will vary depending on course availability.
- Program completion time may vary based on student scheduling and course availability. For details, go to **mstc.edu/schedule**.
- Get the latest updates online at **mstc.edu**.

SAMPLE PART-TIME CURRICULUM OPTION

IT Software Developer • 63 Total Credits

Term 11 Credits

Course Number	Course Name	CPL	Credits
10152101	Intro to Programming	Yes	3
10152121	Object-Oriented Programming 1	Yes	3
10152150	Web Design 1	Yes	3
10152103	IT Exploration	Yes	1
10890102	GPS for Student Success	Yes	1

Term 9 Credits

Course Number	Course Name	CPL	Credits
10152122	Object-Oriented Programming 2	No	3
10152159	User Experience Design	No	3
10156101	Database Concepts and Design	No	3

Term 9 Credits

Course Number	Course Name	CPL	Credits
10152178	Intro to Artificial Intelligence	No	1
10801196	Quantitative Reasoning	Yes	3
10801195 or 10801136	Written Communication or English Composition 1	Yes	3

Term 6 Credits

Course Number	Course Name	CPL	Credits
10152174	Collaborative Application Development	Yes	3
10801196 or 10801198	Oral/Interpersonal Communication or Speech	Yes	3

Term 9 Credits

Course Number	Course Name	CPL	Credits
10152155	Web Programming 1	No	3
10156102	SQL Development	No	3
10801197	Technical Reporting	No	3

Term 6 Credits

Course Number	Course Name	CPL	Credits
10152158	Web Programming 2	No	3
10809166	Introduction to Ethics: Theory & Application	Yes	3

Term 6 Credits

Course Number	Course Name	CPL	Credits
10152160	Introductory Mobile Application Development	No	3
10152175	Software Architecture	No	3

Term 9 Credits

Course Number	Course Name	CPL	Credits
10151162	Secure Software Applications	No	3
10152176	Application Development Capstone	No	3
10809198 or 10809188	Introduction to Psychology or Developmental Psychology	Yes	3

Application Development Capstone
10152176
3 credits
Learners form self-directed Agile teams working with a client where each team will be responsible for identifying, designing, and implementing a software application. Teams will manage their projects, communicate project status, adapt to changing requirements, and overcome technical challenges. Students will build their application leveraging Agile project management software to manage their project. Additional topics: Agile software development methodology and team-based communication.
Prerequisites: Software Architecture 10152175, Web Programming 1 10152155, SQL Development 10156102, and Introductory Mobile Application 10152160

Collaborative Application Development
10152174
3 credits
Provides students with introductory experience in full-stack web development within an agile team environment. Students collaborate to design, build, test, and deploy scalable applications using modern frameworks such as Angular, Node.js, and MongoDB. Emphasis is placed on agile practices including sprint planning, daily standups, retrospectives, and continuous integration/continuous delivery (CI/CD). Students explore team-based problem solving, version control strategies, and introductory test-driven development concepts. The course also develops professional and interpersonal skills essential to collaborative software engineering. Students practice effective communication, conflict management, and feedback in cross-functional teams while applying emotional and cultural intelligence. Additional topics include software licensing, intellectual property rights, and ethical use of third-party code. Graduates of this course will be prepared to work productively in professional agile development environments using contemporary tools and workflows.
Prerequisites: Web Design 1 10152150, Intro to Programming 10152101 Corequisite: Oral/Interpersonal Communication 10801196

Database Concepts and Design
10156101
3 credits
Introduces the concepts of relational database design, development, and maintenance. Topics include relational normalization, referential integrity, and Structured Query Language (SQL).
Prerequisite: Object-Oriented Programming 1, 10152121

Developmental Psychology
10809188
3 credits
Studies human development throughout the lifespan and explores developmental theory and research with an emphasis on the interactive nature of the biological, cognitive, and psychosocial changes that affect the individual from conception to death. Application activities and critical thinking skills enable students to gain an increased knowledge and understanding of themselves and others.
Prerequisite: High School GPA of 2.6 and MMR and MMW or Accuplacer Reading Skills of 236 and Writing of 237 or ACT of 15 Reading/16 English

English Composition 1
10801136
3 credits
Learners develop and apply skills in all aspects of the writing process. Through a variety of learning activities and written documents, learners employ rhetorical strategies, plan, organize and revise content, apply critical reading strategies, locate and evaluate information, integrate and document sources, and apply standardized English language conventions.
Prerequisite: High School GPA of 2.6 and MMW or Accuplacer Writing of 262 or Accuplacer Reading 253 or ACT English score of 20 or ACT Reading 21 or completion of College Reading and Writing 1 10831104 with a "C" or better

GPS for Student Success
10890102
1 credit
Integrate necessary skills for student success by developing an academic plan, identifying interpersonal attributes for success, adopting efficient and effective learning strategies, and utilizing Mid-State resources, policies, and processes. This course is recommended to be completed prior to obtaining 12 credits and is a graduation requirement unless you receive an exemption from your program advisor.

Intro to Artificial Intelligence
10152178
1 credit
This course introduces the foundational concepts of Artificial Intelligence (AI) and its role in shaping modern society. Students will explore AI's applications in fields ranging from entertainment to healthcare, with hands-on examples and interactive discussions. Students will engage with tools and techniques relevant to their fields ensuring that all participants gain valuable insights into how AI is transforming industries and creating new career opportunities. By the end of this course, students will be equipped to understand and navigate the AI-driven world with confidence.

Introduction to Ethics: Theory & Application
10809166
3 credits
Provides a basic understanding of the theoretical foundations of ethical thought. Diverse ethical perspectives are used to analyze and compare relevant issues. Students critically evaluate individual, social, and/or professional standards of behavior, and apply a systemic decision-making process to these situations.
Prerequisite: High School GPA of 2.6 and MMR and MMW or Accuplacer Reading Skills of 236 and Writing of 237 or ACT of 15 Reading/16 English

Intro to Programming
10152101
3 credits
Applies the basic concepts of computer programming having learners build Python applications, with an emphasis on problem solving, structured programming, debugging, and testing. Additional topics include: online software development resources, programming and documentation standards, variable lifetime/scope, data types, control structures (conditions and iterations) working within Microsoft Windows, and mathematical calculations.

Introduction to Psychology
10809198
3 credits
This science of psychology course is a survey of multiple aspects of behavior and mental processes. It provides an overview of topics such as research methods, theoretical perspectives, learning, cognition, memory, motivation, emotions, personality, abnormal psychology, physiological factors, social influences, and development.
Prerequisite: High School GPA of 2.6 and MMR and MMW or Accuplacer Reading Skills of 236 and Writing of 237 or ACT of 15 Reading/16 English

Introductory Mobile Application Development
10152160
3 credits
Provides instruction in developing software applications for mobile devices using the Microsoft Visual Studio and Maui.
Prerequisite: Object-Oriented Programming 2 10152122, Database Concepts and Design 10156101 or consent of instructor

Introductory Statistics
10804189
3 credits
Students taking Introductory Statistics display data with graphs, describe distributions with numbers, perform correlation and regression analyses, and design experiments. They use probability and distributions to make predictions, estimate parameters, and test hypotheses. They draw inferences about relationships including ANOVA. Algebra knowledge and foundational skills in mathematics are important for success in this course.
Prerequisite: High School GPA of 2.6 and MMM_2 or Accuplacer QAS 241 or ACT Math score of 19 or Pre-Algebra 10834109 or College Math 10804107 with a "C" or better

IT Exploration
10152103
1 credit
This course provides first-semester Information Technology students with hands-on professional development and career exploration opportunities. Students will gain practical insight into the IT profession through participation in industry-related activities including company tours, professional organization meetings, guest speaker events, and networking opportunities.

Object-Oriented Programming 1
10152121
3 credits
Introduces object-oriented programming and design, with a focus on building the conceptual framework necessary to understand and build object-oriented programs. This course uses C# .NET, and the Unified Modeling Language (UML), to present concepts from a variety of perspectives. Learners will create UML diagrams and write/debug C# .NET applications, applying the object-oriented basics of abstraction, encapsulation, inheritance and polymorphism. Additional topics include: object instantiation/lifetime/scope, methods, properties, visibility modifiers and collections/multiplicity.
Corequisites: Intro to Programming 10152101

Object-Oriented Programming 2
10152122
3 credits
Builds upon the object-oriented concepts learned in Object-Oriented Programming 1, continuing with an in-depth application of object-oriented design principles and patterns. Focus is put on SOLID principles of OO development, and coding to abstraction, utilizing Factory, Strategy, and Observer patterns. Additional topics include delegates, iterators, and data structures.
Prerequisite: Object-Oriented Programming 1 10152121

Oral/Interpersonal Communication
10801196
3 credits
Focuses on developing effective listening techniques and verbal and nonverbal communication skills through oral presentation, group activity, and other projects. The study of self, conflict, and cultural contexts will be explored, as well as their impact on communication.
Prerequisite: High School GPA of 2.6 and MMR and MMW or Accuplacer Reading Skills of 236 and Writing of 237 or ACT of 15 Reading/16 English or College Reading and Writing with a C or better

Quantitative Reasoning
10804135
3 credits
This course is intended to develop analytic reasoning and the ability to solve quantitative problems. Topics to be covered may include construction and interpretation of graphs; descriptive statistics; geometry and spatial visualizations; math of finance; functions and modeling; probability; and logic. Appropriate use of units and dimensions, estimates, mathematical notation, and available technology will be emphasized throughout the course.
Prerequisite: High School GPA of 2.6 and MMM_1 or Accuplacer QAS 241 or ACT Math score of 19 or Pre-Algebra 10834109 or College Math 10804107 with a "C" or better

Secure Software Applications
10151162
3 credits
The Secure Software Applications course teaches students about the most common attacks against applications and how to defend against those attacks through secure coding practices and good security hygiene. The class focuses on the OWASP top 10, certificates, code scanning, SDLC Security automation and more.
Prerequisite: Intro to Programming 10152101

Software Architecture
10152175
3 credits
Introduces N-tier software architecture where learners work in Agile teams to create and deploy ASP.NET applications comprised of data access, business, and presentation layers using MVC architecture. The application will access data from a relational database. Additional topics include: Agile project management, team communication and conflict management, requirements gathering, version control, authentication, authorization, and consuming web services.
Prerequisites: Collaborative Application Development 10152174, Object-Oriented Programming 2 10152122, Database Concepts and Design 10156101; Corequisite: Quantitative Reasoning 10804135, Web Programming 1 10152155

Speech
10801198
3 credits
Explores the fundamentals of effective oral presentation to small and large groups. Topic selection, audience analysis, methods of organization, research, structuring evidence and support, delivery techniques, and other essential elements of speaking successfully, including the listening process, form the basis of this course. Includes informative, persuasive, and occasion speech presentations.
Prerequisite: High School GPA of 2.6 and MMR and MMW or Accuplacer Reading Skills of 253 and Writing of 262 or ACT of 21 Reading/19 English or completion of College Reading and Writing 1 10831104 with a "C" or better

SQL Development
10156102
3 credits
Expands on Database Concepts and Design, with advanced SQL syntax (indexes, views, stored procedures, and triggers), database design, and data transformation. Additional topics include alternate database technologies, data warehousing, emerging database trends, and database administration and security.
Prerequisites: Database Concepts and Design 10156101, Introduction to Programming 10152101; Corequisite Quantitative Reasoning 10804135

Technical Reporting
10801197
3 credits
The student prepares and presents oral and written technical reports. Types of reports may include lab and field reports, proposals, technical letters and memos, technical research reports, and case studies. Designed as an advanced communication course for students who have completed at least the prerequisite introductory writing course.
Prerequisite: English Composition 1 10801136 or Written Communication 10801195 with a "C" or better

User Experience Design
10152159
3 credits
Examines the design, prototyping, and evaluation of user interfaces. Learners will apply user experience standards in the development of web and software interfaces to provide a quality user experience. Topics include psychological and interaction principles (including ADA and international standards), requirements analysis, designing for different devices, style guides, usability testing, and visual design principles.
Corequisite: Web Design 1 10152150

Web Design 1
10152150
3 credits
Introduces HTML and Cascading Style Sheets (CSS) coding techniques. Learners will create/modify web pages using HTML tags and style the web pages with CSS and JavaScript. For the final course project, learners will create a personal website portfolio. Additional topics include inclusive design, copyright considerations, text editors, image optimization, FTP utilities, and browser tools.

Web Programming 1
10152155
3 credits
Provides students with practical skills to design, develop, deploy, and maintain modern full-stack web applications. Students will use current real-world practices in cloud deployment, automated CI/CD pipelines, containerization with Docker and Kubernetes, identity and authentication, debugging, and secure SQL database integration. Included skills are configuring cloud infrastructure, implementing scalable deployment workflows, managing cloud-based databases, and applying best practices for security, reliability, and maintainability in professional web applications.
Prerequisite: Object Oriented Programming 1 10152121; Corequisite: Database Concepts and Design 10156101

Web Programming 2
10152158
3 credits
Expands upon modern web development practices by integrating artificial intelligence and machine learning concepts into full-stack applications. Students will explore foundational AI domains including supervised, unsupervised, and reinforcement learning, as well as natural language processing, computer vision, and transformer-based large language models. Emphasis is placed on developing intelligent, data-driven web solutions using neural networks, Retrieval-Augmented Generation (RAG), and agent-based architectures. Students will gain experience implementing cloud-based AI pipelines, integrating Model Context Protocol (MCP) for contextual data interaction, and applying ethical and secure development practices in AI-enabled systems. Skills include configuring and deploying AI models, designing interactive web interfaces for intelligent systems, leveraging modern frameworks for model integration, and adhering to best practices in scalability, transparency, and accountability.
Prerequisites: Web Programming 1 10152155, Quantitative Reasoning 10804135

Written Communication
10801195
3 credits
Develops writing skills which include prewriting, drafting, revising, and editing. A variety of writing assignments are designed to help the learner analyze audience and purpose, research and organize ideas, and format and design documents based on subject matter and content. Also develops critical reading and thinking skills through the analysis of a variety of written documents.
Prerequisite: High School GPA of 2.6 and MMW or Accuplacer Writing of 262 or ACT English score of 20 or completion of College Reading and Writing 1 10831104 with a "C" or better