



it software developer

Associate in Applied Science (AAS) Program Code: 10-152-1 Total Credits: 63-64

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 Android and iOS 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 or simulated clients.

Estimated tuition and fees: mstc.edu/programcosts

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.

CHECKLIST:

This section will be completed when meeting with your academic advisor.

- FAFSA (www.fafsa.gov)
- Financial Aid Form(s)
Form(s): _____
- Follow-Up Appointment:
Where: _____
When: _____
With: _____
- Official Transcripts
Mid-State Technical College
Attention CPL Coordinator
500 32nd Street North
Wisconsin Rapids, WI 54494
- Other: _____

mstc.edu
888.575.6782



ADAMS CAMPUS
401 North Main
Adams, WI 53910

MARSHFIELD CAMPUS
2600 West 5th Street
Marshfield, WI 54449

STEVENS POINT CAMPUS
1001 Centerpoint Drive
Stevens Point, WI 54481

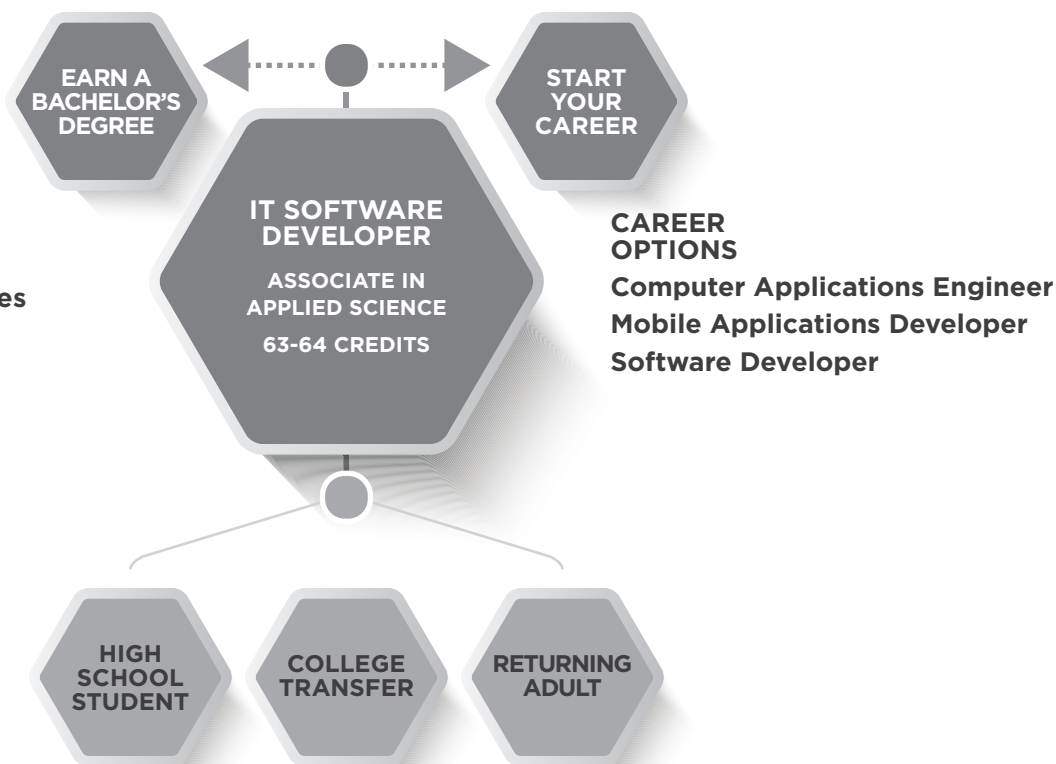
WISCONSIN RAPIDS CAMPUS
500 32nd Street North
Wisconsin Rapids, WI 54494

BACHELOR'S DEGREE OPTIONS

Lakeland University
BA Computer Science

UW-Stout
BS Information and
Communication Technologies

For more information and
additional opportunities,
visit mstc.edu/transfer.



College Credit • Dual Credit • Military Experience • Work Experience
Learn about Credit for Prior Learning at mstc.edu/cpl.

**BEGIN AT ANY POINT
IN THE PATHWAY**

OTHER OPTIONS

RELATED PROGRAMS

- Business Analyst
- IT Computer Support Specialist
- IT Network Specialist
- IT Security Specialist
- Microsoft System Administrator

APPRENTICESHIP OPPORTUNITIES

- IT Software Developer Apprenticeship

PROGRAM OUTCOMES

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

- Design software systems.
- Integrate database systems.
- Develop software applications.
- Develop technical documentation.

TECHNICAL SKILLS ATTAINMENT

The Wisconsin Technical College System (WTCS) has implemented a requirement that all technical colleges measure program 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. Students are notified of TSA reporting in their final few courses of the program.

NOTES:

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 students and must be completed prior to obtaining 12 credits. (Not counted in the total credit value for this program.)

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 must be completed prior to obtaining 12 credits and as a graduation requirement.

ADDITIONAL COURSES AS NEEDED

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

Intro to College Reading

10838104 2 credits

Provides learners with the opportunities to develop and expand reading skills, including comprehension and vocabulary skills. Learners apply reading skills to academic tasks and read to acquire information from a variety of sources.

Intro to College Writing

10831103 3 credits

Introduces basic principles of composition, including organization, development, unity, and coherence in paragraphs and multi-paragraph documents. The purpose of this course is to prepare students for successful entry into required program courses. This course is tuition bearing and under certain circumstances may qualify for financial aid. This course cannot be used to satisfy program completion requirements at Mid-State.

Prerequisite: Accuplacer Sentence Skills score of 60 or equivalent. Proficiency in word processing skills recommended.

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.

Prerequisite: Accuplacer Math score of 65, Accuplacer Algebra score of 30, ABE Math Prep V 76854785 and ABE Math Prep VI 76854786 with a grade of "S." (Note: ABE Math Prep V and VI courses cannot be used to satisfy program completion requirements at Mid-State.)

SAMPLE FULL-TIME CURRICULUM OPTION

Term		15-16 credits
10152101	Intro to Programming	3
10152121	Object-Oriented Programming 1	3
10152150	Web Design 1	3
10801136	English Composition 1	3
10804107	College Mathematics	3
	-or-	
10804118	Intermediate Algebra with Applications	4
	-or-	
10804189	Introductory Statistics	3
Term		15 credits
10152122	Object-Oriented Programming 2	3
10152159	User Experience Design	3
10152174	Collaborative Application Development	3
10156101	Database Concepts and Design	3
10801196	Oral/Interpersonal Communication	-or-
10801198	Speech	3
Term		18 credits
10150110	Networking I	3
10152123	Object-Oriented Programming 3	3
10152155	Web Programming 1	3
10152160	Introductory Mobile Application Development	3
10152175	Software Architecture	3
10156102	SQL Development	3
Term		15 credits
10102130	Career Development	-or-
10152161	Intermediate Mobile Application Development	-or-
10152177	Software Developer Internship	-or-
10801199	Employment Strategies	3
10152158	Web Programming 2	3
10152176	Application Development Capstone	3
10809166	Intro to Ethics: Theory & Application	3
10809188	Developmental Psychology	-or-
10809198	Intro to Psychology	3
Total credits 63-64		

Please Note:

- 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/classfinder.

SAMPLE PART-TIME CURRICULUM OPTION

Term		9 credits
10152101	Intro to Programming	3
10152121	Object-Oriented Programming 1	3
10152150	Web Design 1	3
Term		9 credits
10152122	Object-Oriented Programming 2	3
10152174	Collaborative Application Development	3
10156101	Database Concepts and Design	3
Term		6-7 credits
10801136	English Composition 1	3
10804107	College Mathematics	3
	-or-	
10804118	Intermediate Algebra with Applications	4
	-or-	
10804189	Introductory Statistics	3
Term		9 credits
10152123	Object-Oriented Programming 3	3
10152155	Web Programming 1	3
10156102	SQL Development	3
Term		9 credits
10150110	Networking I	3
10152158	Web Programming 2	3
10152159	User Experience Design	3
Term		6 credits
10801196	Oral/Interpersonal Communication	-or-
10801198	Speech	3
10809166	Intro to Ethics: Theory & Application	3
Term		9 credits
10152160	Introductory Mobile Application Development	3
10152175	Software Architecture	3
10809188	Developmental Psychology	-or-
10809198	Intro to Psychology	3
Term		6 credits
10102130	Career Development	-or-
10152161	Intermediate Mobile Application Development	-or-
10152177	Software Developer Internship	-or-
10801199	Employment Strategies	3
10152176	Application Development Capstone	3
Total credits 63-64		

Application Development Capstone

10152176.....3 credits

Builds team software development and communication skills. Learners form small teams, each identifying, designing, and implementing an attractive and usable software application. Project teams each use Agile software development principles to manage their projects, communicate project status, adapt to changing requirements, and overcome technical challenges. Additional topics include a review of the Agile software development methodology.

Prerequisites: Software Architecture 10152175, Web Programming 1 10152155, and SQL Development 10156102

Career Development

101021303 credits

Prepares learners for the process of gaining employment. Learners assess their personal background; practice finding career opportunities through the job search process; develop a cover letter, resume, and thank you letter, and complete a job application; participate in a mock interview; and demonstrate how to deal with interpersonal situations found in a work environment. NOTE: To enroll, you must have completed 50 percent of technical program credits or receive department approval. See program advisor, program faculty, program counselor, or department dean/associate dean to register.

Collaborative Application Development

10152174.....3 credits

Introduces the Agile software, development methodology, and applies it to managing a software development project. Learners will work in small teams, taking an application through its entire lifecycle including the phases of requirements gathering, analysis, design, development, testing, deployment, and maintenance. Additional topics include an introduction to the following disciplines and related tools: team rules, peer and code reviews, pair programming, stakeholder communication, client meeting planning, project management, version control, issue tracking, unit/regression testing, software licensing, and automated build/deployment.

Prerequisites: Web Design 1 10152150 and Intro to Programming 10152101; Corequisite: Speech 10801198

College Mathematics

108041073 credits

Designed to review and develop fundamental concepts of mathematics pertinent to the areas of: 1) arithmetic and algebra; 2) geometry and trigonometry; and 3) probability and statistics. Special emphasis is placed on problem solving, critical thinking and logical reasoning, making connections, and using calculators. Topics include performing arithmetic operations and simplifying algebraic expressions, solving linear equations and inequalities in one variable, solving proportions and incorporating percent applications, manipulating formulas, solving and graphing systems of linear equations and inequalities in two variables, finding areas and volumes of geometric figures, applying similar and congruent triangles, converting measurements within and between US and metric systems, applying Pythagorean Theorem, solving right and oblique triangles, calculating probabilities, organizing data and interpreting charts, calculating central and spread measures, and summarizing and analyzing data.

Prerequisite: High School GPA of 3.0 or Accuplacer Arithmetic of 250 and QAS 234 or ACT of 17 or Pre-Algebra 834109 with a grade of "C" or better or equivalent. Students are encouraged to bring transcripts for further evaluation if they do not meet these requirements.

Database Concepts and Design

10156101.....3 credits

Introduces the concepts of relational database design, development, and maintenance. Topics include relational normalization, referential integrity, and SQL.

Corequisite: English Composition 1 10801136

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 3.0 or Accuplacer Reading Skills of 236, Writing of 237 or ACT of 15 Reading/16 Writing. Students are encouraged to bring transcripts for further evaluation if they do not meet these requirements.

Employment Strategies

108011993 credits

A course designed to assist students in securing employment. This communication-based course helps develop an awareness of personal and academic skills as they relate to the job seeking process. Topics of study include personal and skill assessments, research of employment sources, completion of application forms, formation of professional resumes, composition of various business letters, interviewing skills, and job offer evaluation. NOTE: To enroll you must have completed 50 percent of technical program credits or receive department approval. See program advisor, program faculty, program counselor, or department dean/associate dean to register.

English Composition 1

108011363 credits

Designed for learners to develop knowledge and skills in all aspects of the writing process. Planning, organizing, writing, editing, and revising are applied through a variety of activities. Students analyze audience and purpose, use elements of research, and format documents using standard guidelines. Individuals develop critical reading skills through analysis of various written documents.

Prerequisite: High School GPA of 3.0 or Accuplacer Writing of 262 or ACT of 20 or Intro to College Writing 10-831-103 with a grade of "C" or better or equivalent. Students are encouraged to bring transcripts for further evaluation if they do not meet these requirements. Proficiency in word processing skills recommended.

Intermediate Algebra with Applications

10804118 4 credits

This course offers algebra content with applications. Topics include properties of real numbers; order of operations; algebraic solution for linear equations and inequalities; operations with polynomial and rational expressions; operations with rational exponents and radicals; and algebra of inverse, logarithmic, and exponential functions.

Prerequisite: High School GPA of 3.0 or Accuplacer Arithmetic of 263 and QAS 234 or ACT of 19 or QAS of 245, or Pre-Algebra 10834109 with a grade of "C" or better or equivalent. Students are encouraged to bring transcripts for further evaluation if they do not meet these requirements.

Intermediate Mobile Application Development

101521613 credits

Provides instruction in developing software applications for mobile devices building upon the knowledge gained in Introductory Mobile Application Development.

Prerequisite: Introductory Mobile Application Development 10152160

Intro to Ethics: Theory & Application

108091663 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 3.0 or Accuplacer Reading Skills of 236, Writing of 237 or ACT of 15 Reading/16 Writing. Students are encouraged to bring transcripts for further evaluation if they do not meet these requirements.

Intro to Programming

101521013 credits

Applies the basic concepts of computer programming using JavaScript, with an emphasis on structured programming, debugging, and testing. Learners will create JavaScript applications. Additional topics include: online software development resources, programming and documentation standards, variable lifetime/scope, data types, control structures and mathematical calculations.

Corequisite: English Composition 1 10801136

Intro to Psychology

108091983 credits

This introductory course surveys the multiple aspects of human behavior. It involves a survey of the theoretical foundations of human functioning in such areas as learning, motivation, emotions, personality, deviance and pathology, physiological factors, and social influences. It directs the student to an insightful understanding of the complexities of human relationships in personal, social, and vocational settings.

Prerequisite: High School GPA of 3.0 or Accuplacer Reading Skills of 236, Writing of 237 or ACT of 15 Reading/16 Writing. Students are encouraged to bring transcripts for further evaluation if they do not meet these requirements.

Introductory Mobile Application Development

101521603 credits

Provides instruction in developing software applications for mobile devices using the Microsoft Visual Studio and Xamarin.

Prerequisite: Object-Oriented Programming 2 10152122, Collaborative Application Development 10152174, and Database Design and Concepts 10156101 or consent of instructor

Introductory Statistics

108041893 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 3.0 or Accuplacer QAS 241 or ACT of 19 or Pre-Algebra 834109 with a grade of "C" or better or College Math 804107 with a grade of "C" or better or equivalent. Students are encouraged to bring transcripts for further evaluation if they do not meet these requirements.

Networking I

101501103 credits

Introduces the architecture, structure, functions, components, and models of the Internet and other computer networks. The principles and structure of IP addressing and the fundamentals of Ethernet concepts, media, and operations are introduced to provide a foundation for the curriculum. By the end of the course, participants will be able to build simple LANs, perform basic configurations for routers and switches, and implement IP addressing schemes. This course is the first of four courses that align with CCNA certification. Covers the objectives of the first CCNA exam but is not designed or intended to be a "test prep" course.

Corequisite: English Composition 1 10801136

Object-Oriented Programming 1

101521213 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, the Unified Modeling Language (UML) and other tools 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 and College Math 10804107

Object-Oriented Programming 2

101521223 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. Learners will translate design patterns from Java and implement them in C# .NET. Additional topics include delegates, iterators, and data structures.

Prerequisite: Object-Oriented Programming 1 10152121

Object-Oriented Programming 3

101521233 credits

Builds upon the object-oriented concepts learned in earlier courses, continuing with an in-depth application of object-oriented design principles and patterns. Learners will research object-oriented design patterns and implement them in JAVA. Additional topics include delegates, iterators, and data structures.

Prerequisite: Object-Oriented Programming 2 10152122

Oral/Interpersonal Communication

108011963 credits

Focuses upon developing speaking, verbal, and non-verbal communication, and listening skills through individual presentations, group activities, and other projects.

Prerequisite: High School GPA of 3.0 or Accuplacer Reading Skills of 236, Writing of 237, or ACT of 15 Reading/16 Writing. Students are encouraged to bring transcripts for further evaluation if they do not meet these requirements.

Software Architecture

101521753 credits

Introduces N-tier software architecture through the exploration of various data access methodologies. Learners will work in Agile teams to create a C# .NET application comprised of data access, business and presentation layers using MVVM architecture. The application will access data from Microsoft SQL Server using a variety of object-relational mapping (ORM) frameworks. Additional development topics include ADO.NET, LINQ, Entity Framework and object-oriented databases. Additional team dynamics topics include communication and written tone, resolving team conflicts, team accountability, and client communication during requirements gathering, and peer evaluations.

Prerequisites: Collaborative Application Development 10152174, Object-Oriented Programming 2 10152122, and Database Concepts and Design 10152156

Software Developer Internship

101521773 credits

Integrates software development skills developed in classroom study with specific occupational experiences at local employment sites. Develops work behavior appropriate to the computer information systems environment.

Prerequisite: Completion of at least 18 credits in IT Software Developer courses or consent of instructor

Speech

108011983 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. Bring transcripts for further evaluation if they do not meet these requirements.

Prerequisite: High School GPA of 3.0 or Accuplacer Reading of 253, Writing of 262, or ACT of 21 Reading/19 Writing, or completion of Intro to College Writing and/or Intro to College Reading with a "C" or better or equivalent. Students are encouraged to bring transcripts for further evaluation if they do not meet these requirements.

SQL Development

101561023 credits

Expands on earlier courses with advanced SQL syntax (indexes, views, stored procedures, and triggers), database design, and data transformation. Additional topics include alternate database technologies, emerging database trends, and database administration and security. Data warehousing concepts are discussed.

Prerequisite: Database Concepts and Design 10156101

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, requirements analysis, designing for different devices, style guides, usability testing, and visual design principles.

Prerequisite: Web Design 1 10152150

Web Design 1

101521503 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. For the final course project, learners will create a personal website portfolio. Additional topics include copyright considerations, text editors, image optimization, FTP utilities, and browser tools.

Corequisite: English Composition 1 10801136

Web Programming 1

10152155.....3 credits

Using server-side technologies, the student creates and demonstrates data connectivity to the web. Tools may include elements of the following languages: HTML, JavaScript, SQL, and PHP. Students retrieve data for display to the web browser and capture data for storage from a web-based form.

Prerequisites: Web Design 1 10152150, Intro to Programming 10152101, and Database Concepts and Design 10156101

Web Programming 2

10152158.....3 credits

Builds on the prior Web Design 1 and Web Programming 1. Introduces advanced topics of JQUERY DOM Manipulations, JQUERY Events, Call backs, Chaining, Hierarchy, and AJAX calls. Also includes Angular JS, Modules using type script, imports/exports, templates and binding, and form controls.

Prerequisites: Web Programming 1 10152155