



IT SOFTWARE DEVELOPER

Associate in Applied Science (AAS) Program Code: 10-152-1 Total Credits: 61

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.

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.

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
1001 Centerpoint Drive
Stevens Point, WI 54481
- ☐ 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.



mstc.edu • 888.575.6782 • TTY: 711



ADAMS CAMPUS
401 North Main
Adams, WI 53910

MARSHFIELD CAMPUS
2600 West 5th Street
Marshfield, WI 54449

**STEVENS POINT
DOWNTOWN CAMPUS**
1001 Centerpoint Drive
Stevens Point, WI 54481

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

CAREER PATHWAY • BEGIN AT ANY POINT



CREDIT FOR PRIOR LEARNING AND EXPERIENCE

CREDIT FOR PRIOR LEARNING AND EXPERIENCE

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

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

CERTIFICATE

FUNDAMENTALS OF PROGRAMMING

Certificate • 9 Credits

For more information and additional opportunities, visit mstc.edu/career-accelerator.

ASSOCIATE OF ARTS (AA)

IT SOFTWARE DEVELOPER

Associate in Applied Science (AAS) • 61 Credits

Start Your Career

- Computer Applications Engineer
- Mobile Applications Developer
- Software Developer
- Full-Stack Developer

BACHELOR'S DEGREE

BACHELOR'S DEGREE OPTIONS

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

OTHER OPTIONS

RELATED PROGRAMS

- IT Network Specialist
- IT Cybersecurity Specialist
- IT User Support Technician

APPRENTICESHIP OPPORTUNITIES

- IT Software Developer Apprenticeship

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

- ## TECHNICAL SKILLS ATTAINMENT

NOTES:

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.

The GPS for Student Success course is required for all Mid-State program students and is recommended to be completed before obtaining 12 credits. (Not counted in the total credit value for this program.) Some students are exempt from this requirement. Please see your program advisor for more information.

10890102 1 credit

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

108311043 credits

108341093 credits

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SAMPLE FULL-TIME CURRICULUM OPTION

Term		16 credits
10152101	Intro to Programming ☑	3
10152121	Object-Oriented Programming 1 ☑	3
10152150	Web Design 1 ☑	3
10152178	Intro to Artificial Intelligence	1
10801195	Written Communication ☑ -OR-	
10801136	English Composition 1 ☑	3
10804135	Quantitative Reasoning ☑	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		15 credits
10152155	Web Programming 1	3
10152160	Introductory Mobile Application Development	3
10152175	Software Architecture	3
10156102	SQL Development	3
10801197	Technical Reporting	3

Term		15 credits
10151162	Secure Software Applications	3
10152158	Web Programming 2	3
10152176	Application Development Capstone	3
10809166	Intro to Ethics: Theory & Application ☑	3
10809198	Intro to Psychology ☑ -OR-	
10809188	Developmental Psychology ☑	3

Total credits 61

☑ This course has options available to receive credit for prior learning (CPL) or work experience. Visit the website at mstc.edu/cpl or contact your advisor for details.

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/schedule.

SAMPLE PART-TIME CURRICULUM OPTION

Term		10 credits
10152101	Intro to Programming ☑	3
10152121	Object-Oriented Programming 1 ☑	3
10152150	Web Design 1 ☑	3
10152178	Intro to Artificial Intelligence	1

Term		9 credits
10152122	Object-Oriented Programming 2	3
10152174	Collaborative Application Development ☑	3
10156101	Database Concepts and Design	3

Term		6 credits
10801195	Written Communication ☑ -OR-	
10801136	English Composition 1 ☑	3
10804135	Quantitative Reasoning ☑	3

Term		6 credits
10152159	User Experience Design	3
10801196	Oral/Interpersonal Communication ☑ -OR-	
10801198	Speech ☑	3

Term		9 credits
10152155	Web Programming 1	3
10156102	SQL Development	3
10801197	Technical Reporting	3

Term		6 credits
10152158	Web Programming 2	3
10809166	Intro to Ethics: Theory & Application ☑	3

Term		6 credits
10152160	Introductory Mobile Application Development	3
10152175	Software Architecture	3

Term		9 credits
10151162	Secure Software Applications	3
10152176	Application Development Capstone	3
10809198	Intro to Psychology ☑ -OR-	
10809188	Developmental Psychology ☑	3

Total credits 61

MULTIPLE MEASURES

Multiple Measures Writing (MMW): High school GPA of 2.6 and successful completion of 2.0 credits of high school writing courses with a "C" or better

Multiple Measures Math 1 (MMM_1): High school GPA of 2.6 and successful completion of 1.0 credits of high school math (Algebra 1 or equivalent) with a "C" or better

Multiple Measures Science 1 (MMS_1): High school GPA of 2.6 and successful completion of 1.0 credits of high school lab science course with a "C" or better

Multiple Measures Reading (MMR): High school GPA of 2.6 and successful completion of 2.0 credits of high school literature courses with a "C" or better

Multiple Measures Math 2 (MMM_2): High school GPA of 2.6 and successful completion of 2.0 credits of high school math including Algebra 1 and Algebra 2 with a "C" or better

Multiple Measures Science 2 (MMS_2): High school GPA of 2.6 and successful completion of 1.0 credits of high school chemistry with a "C" or better

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

COURSE DESCRIPTIONS

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

Introduces the Agile software development methodology and applies it to managing software development projects using the Atlassian suite of products. Students will work in small teams developing web-based applications. Additional topics: gathering requirements, team rules, peer evaluations, code reviews, pair programming, stakeholder and team communication, project management, version control, unit testing, licensing, and build automation.

Prerequisites: Web Design 1 10152150, Intro to Programming 10152101 Corequisite: Oral/Interpersonal Communication 10801196.

College Mathematics

10804107.....3 credits

This course is designed to review and develop fundamental concepts of mathematics in the areas of algebra, geometry, trigonometry, measurement and data. Algebra topics emphasize simplifying algebraic expressions, solving linear equations and inequalities with one variable, solving proportions and percent applications. Geometry and trigonometry topics include; finding areas and volumes of geometric figures, applying similar and congruent triangles, applying Pythagorean Theorem, and solving right triangles using trigonometric ratios. Measurement topics emphasize the application of measurement concepts and conversion techniques within and between U.S. customary and metric system to solve problems. Data topics emphasize data organization and summarization skills, including: frequency distributions, central tendency, relative position and measures of dispersion. Special emphasis is placed on problem solving, critical thinking and logical reasoning, making connections, and using calculators.

Prerequisite: High School GPA of 2.6 and MMM_1 or Accuplacer Arithmetic of 250 and QAS 234 or ACT Math score of 17 or Pre-Algebra 10834109 with a "C" or better

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).

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 ACT English score of 20 or completion of College Reading and Writing 1 10831104 with a "C" or better

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 2.6 and MMM_1 or Accuplacer Arithmetic of 263 and QAS 234 or ACT Math score of 19 or QAS of 245 or Pre-Algebra 10834109 with a "C" or better

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.

Intro 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

COURSE DESCRIPTIONS

Intro to Programming ☑

101521013 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.

Intro to Psychology ☑

108091983 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

101521603 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 ☑

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 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

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 ☑

108011963 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

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

101511623 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 10152156.

COURSE DESCRIPTIONS

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. 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

101561023 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 College Math 10804107

Technical Reporting

108011973 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

101521593 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

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 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

101521553 credits

Provides instruction in php to teach students how to develop full-stack web applications. Students will work with the following languages/technologies: PHP, HTML, CSS, JavaScript, jQuery, SQL, and bootstrap. Additional topics include Object-Oriented and MVC.

Prerequisites: Database Concepts and Design 10156101, Collaborative Applications Development 10152174, and Object Oriented Programming 1 10152121

Web Programming 2

101521583 credits

Students will learn how to develop applications using Angular and NOSQL using Mongo. Additional topics include type script, templates, binding, form controls, and other front-end development frameworks.

Prerequisites: Web Programming 1 10152155, Collaborative Application Development 10152174.

Written Communication

108011953 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