Madison Area Technical College

# Information Technology—
# Web Analyst / Programmer

Effective: 2012-2013

Program Number: 10-152-4

Associate in Applied Science Degree

Information Technology Program Cluster

School of Agriscience and Technologies

Program offered at Madison Campuses

For information call: (608) 246-6800 or
(800) 322-6282 Ext. 6800

## About the Program

The Web Analyst/Programmer program meets the specific skills and knowledge requirements of technical and professional jobs within the Information Technology field for an entry-level web analyst/programmer. It is designed to meet entry-level educational needs of most segments of the IT field which utilize a variety of computers. Training blends general educational development and required IT technical skills. Graduates are prepared for entry-level web developer jobs in government, insurance, manufacturing, service, software development, wholesale and retail sales, utilities, banking and accounting.

## Requirements for Admission

High school diploma, HSED, or GED with a minimum grade point average of 2.0 or equivalent and General knowledge of Microsoft Windows

NOTE: Students starting this program in a spring semester will need a minimum of 5 semesters to complete the program due to some courses being offered fall only or spring only. These students (and students going part-time) are advised to use the Planner in their student center account to map out the order in which to take the required courses semester by semester, taking into account any limited semesters courses are offered and any pre-requisites for the sequence of courses.

## Program Courses

10-152-101 Introduction to Visual Basic.NET Programming 3 credits

Teaches the basic concepts of VB.NET programming. Topics include the Visual Studio Integrated Development Environment, program logic constructs, event-driven programming techniques, and development in an object-oriented context. Prerequisite: 10-107-111 and 10-152-119.

10-152-102 Advanced Visual Basic.NET 3 credits

The course provides students with a comprehensive understanding of object-oriented system development. It examines and uses the prewritten .NET Framework classes and explores the MSDN help facility. Topics include: collections, exception handling, interfaces and advanced development techniques such as XML and database programming using ADO.NET. Prerequisites: 10-152-101 and 10-152-124.

10-152-103 Web Application Development Using ASP.NET 3 credits

Students learn to develop Microsoft ASP.NET applications that deliver dynamic content to the web. An emphasis is placed on server-side programming and the role of ASP.NET plays. As part of the class, students create web forms with server controls, display dynamic data from a database using Microsoft ADO.NET, read XML configuration files and learn to debug ASP.NET web pages. Prerequisites: 10-152-102 and 10-152-120.

10-152-111 Introduction to Java Programming 3 credits

Introduces programming and object-oriented design concepts using the Java programming language. Students learn all the Java programming basics and use a simple text editor as a development environment. Design concepts and programming tools will be integrated with an emphasis on practical business solutions. Prerequisites: 10-107-111 and 10-152-119.

# Curriculum

The courses listed below outline the requirements for graduation for students entering this program in the 2012-2013 academic year. Requirements for graduation may vary depending on the semester in which a student is admitted to their program. Current/continuing students should consult their degree progress report available through their student center account for specific graduation requirements. Program requirements are subject to change.

## FIRST YEAR

| First Semester | | Credits | Hrs/week Lec-Lab |
|---|---|---|---|
| 10-107-111 | Careers in IT | 1 | 1-0 |
| 10-150-160 | IT Security Awareness | 1 | 1-0 |
| 10-152-119 | Introduction to Programming with JavaScript | 3 | 2-2 |
| 10-152-120 | Website Development-HTML5 | 3 | 2-2 |
| 10-152-124 | Introduction to Database | 3 | 2-2 |
| 10-801-195 | Written Communication | 3 | 3-0 |
| 10-804-144 | Math of Finance | 3 | 3-0 |
| | Semester Total | 17 | |

| Second Semester | | | |
|---|---|---|---|
| *Course #1* | Emphasis Area Course #1 (*see below*) | 3 | 2-2 |
| 10-152-125 | SQL Database Programming | 3 | 2-2 |
| 10-152-130 | Object-Oriented Design with UML | 3 | 2-2 |
| 10-801-196 | Oral/Interpersonal Communication | 3 | 3-0 |
| 10-809-197 | Contemporary American Society | 3 | 3-0 |
| 10-809-199 | Psychology of Human Relations | 3 | 3-0 |
| | Semester Total | 18 | |

## SECOND YEAR

| First Semester | | | |
|---|---|---|---|
| *Course #2* | Emphasis Area Course #2 (*see below*) | 3 | 2-2 |
| 10-107-175 | Job Search Preparation | 1 | 1-0 |
| 10-152-121 | Advanced Website Development | 3 | 2-2 |
| 10-152-131 | Object-Oriented Systems Analysis* | 3 | 2-2 |
| 10-801-197 | Technical Reporting | 3 | 3-0 |
| | Elective | 3 | E |
| | Semester Total | 16 | |

| Second Semester | | | |
|---|---|---|---|
| *Course #3* | Emphasis Area Course #3 (*see below*) | 3 | 2-2 |
| 10-152-126 | Database Design and Data Warehousing** | 3 | 2-2 |
| 10-152-132 | Web Analyst/Programmer Internship** | 3 | 2-2 |
| 10-152-168 | AJAX and JavaScript Web Development | 3 | 2-2 |
| 10-809-166 | Introduction to Ethics: Theory and Application | 3 | 3-0 |
| | Elective | 3 | E |
| | Semester Total | 18 | |

| .NET Emphasis | | Course Sequence |
|---|---|---|
| 10-152-101 | Introduction to Visual Basic.NET Programming** | #1 |
| 10-152-102 | Advanced Visual Basic.NET* | #2 |
| 10-152-103 | Web Application Development Using ASP.NET** | #3 |

| Java Emphasis | | Course Sequence |
|---|---|---|
| 10-152-111 | Introduction to Java Programming | #1 |
| 10-152-112 | Advanced Java Programming* | #2 |
| 10-152-113 | Enterprise Java Programming** | #3 |

| PHP Emphasis | | Course Sequence |
|---|---|---|
| 10-152-166 | PHP Web Development with MySQL | #1 |
| 10-152-167 | Advanced PHP & MySQL Web Development* | #2 |
| 10-152-157 | Ruby on Rails Development** | #3 |

*Offered fall semester only **Offered spring semester only

*Note*: All Information Technology courses require a grade of C or better in order to graduate.

*Note: Students are assessed for correct placement in English or mathematics courses based on their scores on the COMPASS test or on completion of the appropriate prerequisite(s). Additionally, there may be courses in other subject areas that may use COMPASS scores as prerequisites when reading, writing, math, or critical thinking competencies are required.*

Recommended Electives

Electives must be associate degree (10-level) or college transfer (20-level) courses.

| | | |
|---|---|---|
| 10-150-101 | Network Essentials | 3 credits |
| 10-152-141 | C# Programming in Visual Studio.NET * | 3 credits |
| 10-152-143 | iPhone Applications Development * | 3 credits |
| 10-152-189 | Android Applications Development – IDC* | 3 credits |

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## Program Courses (continued)

10-152-112 Advanced Java Programming 3 credits
Focuses on the server side of application programming for the web. Topics include: Java servlets, database access with JDBC, JavaServer Pages and JavaBeans. A portion of the class deals with application design issues in a web environment. Prerequisites: 10-152-111 and 10-152-125.

10-152-113 Enterprise Java Programming 3 credits
The third class of the Java sequence explores advanced Java topics within the J2EE application framework. Topics include JDBC, Enterprise JavaBeans, Servlets, JSPs, XML, JMS, JNDI, Web Services, custom tag libraries, web applications and enterprise applications. Prerequisites: 10-152-112 and 10-152-121.

10-152-119 Introduction to Programming with JavaScript 3 credits
Teaches the basic concepts of programming using the JavaScript language. Topics include: embedding JavaScript in HTML, event-driven programming techniques, program control logic, and an introduction to object-oriented programming. Prerequisite: concurrent enrollment in 10-152-120.

10-152-120 Website Development-HTML5 3 credits
Teaches the fundamentals and techniques of developing business websites using XHTML-compliant HTML5. Topics include webpage design, tables, image manipulation, image maps, forms, , cascading style sheets (CSS) and an introduction to JavaScript in conjunction with forms. All work is done directly with HTML5. Prerequisite: Working knowledge of Microsoft Windows (computer literacy, proficiency with a mouse, file management).

10-152-121 Advanced Website Development-XML 3 credits
Provides the student with experience in the design and implementation of business internet websites using advanced command syntax. Topics include: JavaScript, browser object models, dynamic HTML, advanced cascading style sheets (CSS), XML, document type definitions, extensible stylesheet language transformations (XSLT), and XML schemas. Prerequisite: 10-152-120.

10-152-124 Introduction to Database 3 credits
Introduces the student to relational database concepts using the MS Access database environment. Students learn to use various software tools to use queries, forms and reports in developing comprehensive business applications using MS/Access. Prerequisite: Working knowledge of Microsoft Windows (computer literacy, proficiency with a mouse, file management).

10-152-125 SQL Database Programming 3 credits
Presents relational database concepts and teaches beginning to intermediate Structured Query Language (SQL) using an Oracle database. Students learn to create and maintain database objects and to store, retrieve, and manipulate data. Demonstrations and hands-on practice reinforce the fundamental concepts. Prerequisite: 10-152-124.

10-152-126 Database Design and Data Warehousing 3 credits
Study of the construction of relational databases. Activities include: designing a database using the relational database model, implementing a database in normal form and demonstrating a functional database in terms of performance, integrity and security. Prerequisites: 10-152-125, 10-152-131.

10-152-130 Object-Oriented Design w/UML 3 credits
Practical, introductory-level systems analysis experience. Emphasis is on the physical system elements: data design (record, file, database and entity-relationship diagrams), object-oriented design (use case, class and sequence diagrams), user interface design (screen and report) and system interface design (platforms and factoring). The use of CASE tools is integrated throughout the course. Prerequisites: 10-152-119 and 10-152-124.

10-152-131 Object-Oriented Systems Analysis 3 credits
In this course, the student learns to analyze the business organization as a system, to structure both the information and processes of a business or organization, and to complete the systems development process through the logical design phase. The course utilizes an object-oriented methodology for the systems development process. Prerequisite: 10-152-130.

10-152-132 Web Analyst/Programmer Internship 3 credits
Opportunities for students to learn and practice web programming and analysis techniques through activities and experiences in an actual information systems department. Students will seek internship opportunities and interview to be selected for internships. The student spends approximately 216 hours over the course of the semester at the internship site. If no internship is available, a special project may be substituted for the internship by consent of the instructor. Activities include designing and testing new web programs, designing and modifying existing web programs, object oriented systems analysis and design, and sharing experiences with other interns. Prerequisites: 10-107-175, 10-152-121 and 10-152-131 and one of the following: 10-152-102 or 10-152-112 or 10-152-167.

10-152-157 Ruby on Rails Development 3 credits
Introduces the student to dynamic web page development using the Ruby on Rails web development framework. The course will also use the popular MySQL open source database management system. Topics will include an introduction to the Ruby programming language, installing Ruby and Ruby on Rails, an overview of the Rails Framework, ActiveRecord basics, ActionController coding, Action Views, AJAX and the Web 2.0, ActionMailer basics, security, deployment, and scaling. Students will produce a very modern web application that can be adapted to many professional web development needs. Prerequisite: Acceptance into certificate and grade of C or better in 10-152-167 or 10-152-102 or 10-152-112.

10-152-166 PHP Web Development with MySQL 3 credits
This course introduces the student to dynamic web page development using the PHP programming language. Students will learn how PHP works, how to effectively use many of its powerful features, and how to design and build their own PHP web applications. The popular MySQL open source database management software (DBMS) will also be introduced as a powerful backend for PHP websites. Prerequisite: 10-152-119 and 10-152-120.

10-152-167 Advanced PHP and MySQL Web Development 3 credits
This course prepares the student to implement professional PHP and MySQL web applications. Students will learn advanced techniques for session management, validation, and authentication. Advanced web application features such as shopping carts, content management using Drupal, web forums and connecting to web services are discussed. Installation and customization of open source PHP web applications is also covered. Prerequisite: Grade of C or better in 10-152-125 and 10-152-166.

10-152-168 AJAX and JavaScript Web Development 3 credits
AJAX turns static web pages into interactive applications, allowing you to deploy rich-client applications. Course covers the basics of DHTML, JavaScript, and the XmlHttpRequest call. Students learn how to add JavaScript and AJAX to existing programs, and design new applications to exploit the power of Web 2.0. Students learn the three layers of AJAX framework, and when (and how) to use each. Students learn how to create rich clients, use visual effects, add client-side validation, and handle forms. Prerequisites: grade of C or better in 10-152-121 and one of the following: 10-152-102, 10-152-112 or 10-152-167.

## Career Potential:

- Web Developer
- Web Application Developer
- Programmer/Analyst

With additional education and/or work experience, graduates may find employment as:

- Web Designer
- Web Architect
- Systems Analyst
- Systems Programmer
- Database Programmer
- Project Manager
- Information Systems Department Manager

*More detailed and updated information on this program may be available at: madisoncollege.org. The college reserves the right to make changes in the regulations and courses announced in this publication without notice.*

*Madison Area Technical College provides equal opportunity in education and employment.*

*Rev. 03/12*