Computer Software Development Major and Computer Software Development Certificate (CSD & CSDC)

Computer Programming and Database Management - Computer Software Development Major (CSD)

The Computer Programming and Database Management - Computer Software Development Major (CSD) is an online degree focused on the design, development, implementation, and maintenance of software used in a variety of industries. Students gain knowledge of computer operating systems and software development using several programming languages.

Graduates earn an Associate of Applied Science degree and are prepared to enter the workforce as skilled computer programmers and systems integrators. Graduates may continue their education in a bachelor's degree program in computer science, information systems, business informatics, or business administration.

The Computer Software Development Major is primarily offered as an online degree for students who seek that instructional method. Some of the required courses can be taken through in-person classes.

For more information, please contact the Engineering and Information Technologies Division at (513) 569-1743.

To apply for this program at Cincinnati State, visit the Admissions (http://www.cincinnatistate.edu/academics/admission/) section of the College website.

Computer Software Development Certificate (CSDC)

The Computer Software Development Certificate assists individuals seeking computer skills needed in a variety of industries, focusing on current software development languages, object-oriented programming concepts, and database theory.

The certificate is intended for experienced programmers looking to update or enhance their skills, or for individuals preparing to enter the information technology field who already have a bachelor's degree in another discipline.

The certificate can be completed in three semesters, and all courses are offered through online education.

For more information, please contact the Engineering and Information Technologies Division at (513) 569-1743.

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Computer Programming and Database Management - Computer Software Development Major (CSD)

Semester 1		Lec	Lab	Credits
FYE 100	Essentials for College Success (**B**)	1	0	1
ENG 101	English Composition 1 (**G**)	3	0	3
IT 100	Computer Programming Foundations (**B**)	2	3	3
PHI 110	Ethics (**G**)	3	0	3
MAT XXX Mathematics Elective (**G**)		2	2	3
Semester 2				
IT 101	Programming 1 (**B**)	2	3	3
IT 111	Database Design and SQL 1 (**B**)	2	3	3
ENG 10X English Composition Elective (**G**)		3	0	3
CPDM 210	System Analysis and Design (**T**)	2	3	3
Semester 3				
IT 102	Programming 2 (**B**)	2	3	3
CPDM 120	Fundamentals of Object-Oriented Programming using Python (**T**)	2	3	3
XXX XXX Technical Track Elective 1 (**T**)		2	3	3
ECO 1XX Economics Elective (**G**)		3	0	3
Semester 4				
IT 161	Java Programming 1 (**T**)	2	3	3
SET 151	C Programming 1 (**T**)	2	3	3
IT 117	Web Application Development 1 (**T**)	2	3	3
XXX XXX Technical Track Elective 2 (**T**)		1	40	2
Semester 5				
CPDM 290	Computer Programming and Database Management Capstone (**T**)	2	3	3
SET 252	C Programming 2 (**T**)	2	3	3
IT 262	Java Programming 2 (**T**)	2	3	3
IT 218	Web Application Development 2 (**T**)	2	3	3
Total Credits:		**44**	**84**	**60**

Electives

Mathematics Elective

MAT 124	Applied Algebra and Geometry	4
MAT 125	Algebra and Trigonometry [*]	4
MAT 131	Statistics 1	3
MAT 151	College Algebra	4

Economics Elective

ECO 105	Principles of Microeconomics	3
ECO 110	Principles of Macroeconomics	3

English Composition Elective

ENG 102	English Composition 2: Contemporary Issues	3
ENG 103	English Composition 2: Writing about Literature	3
ENG 104	English Composition 2: Technical Communication	3
ENG 105	English Composition 2: Business Communication	3

Technical Track Electives (Choose courses from 1 track)

Database Analytics Track

IT 112	Database Design and Management	3
IT 212	Business Intelligence, Data Warehousing, and Reporting	3

Experiential Learning Track (Choose courses from 1 experiential learning group)

Cooperative Education Experiential Learning

CPDM 190	Cooperative Education Preparation: Computer Programming and Database Management	1
CPDM 291	Full-Time Cooperative Education 1: Computer Programming and Database Management	2
CPDM 292	Full-Time Cooperative Education 2: Computer Programming and Database Management	2

Project-Based Experiential Learning

CPDM 190	Cooperative Education Preparation: Computer Programming and Database Management	1
CPDM 296	Project-Based Learning 1	2
CPDM 297	Project-Based Learning 2	2

* Not available online

Some courses are offered in alternative versions identified with a letter after the course number-- for example, ENG 101 and ENG 101A.

- This curriculum displays only course numbers without the added letter.
- The alternative version, when available, meets the requirements of the course version without the added letter.

The letters G, B, and T (displayed after course titles or elective descriptions) identify types of courses required by the Ohio Department of Higher Education as part of an associate's degree curriculum.

G = General Education course in this curriculum

B = Basic Skills course in this curriculum

T = Technical course in this curriculum

Computer Software Development Certificate (CSDC)

First Year

Semester 1		Lec	Lab	Credits
IT 101	Programming 1	2	3	3
IT 111	Database Design and SQL 1	2	3	3
Semester 2				
IT 102	Programming 2	2	3	3
CPDM 120	Fundamentals of Object-Oriented Programming using Python	2	3	3
Semester 3				
XXX XXX Technical Elective 1		2	3	3
XXX XXX Technical Elective 2		2	3	3
Total Credits:		**12**	**18**	**18**

Electives

Technical Electives (select 2 courses)

IT 161	Java Programming 1	3
SET 151	C Programming 1	3
IT 117	Web Application Development 1	3

Some courses are offered in alternative versions identified with a letter after the course number-- for example, ENG 101 and ENG 101A.

- This curriculum displays only course numbers without the added letter.
- The alternative version, when available, meets the requirements of the course version without the added letter.

Computer Programming and Database Management (CINS, CSD, SET)

- Students will collect, disseminate, analyze, and apply the requirements for a specific software development project.
- Students will write, test, and maintain software applications utilizing current and relevant programming languages.
- Students will design and implement a normalized relational database(s) to meet the needs of the software development project.
- Students will effectively utilize databases and database management systems to organize, store, and retrieve data for use in application software.
- Students will create application software that is intuitive for use by a wide range of users.
- Students will effectively articulate their ideas, recommendations, and solutions.
- Students will lead and/or participate effectively in teams.
- Students will demonstrate their ability to utilize appropriate resources to broaden their knowledge and apply the industry's latest development tools, techniques, and standards.

CPDM Courses

CPDM 120 Fundamentals of Object-Oriented Programming using Python
3 Credits. 2 Lecture Hours. 3 Lab Hours.
A course on fundamentals of object-oriented programming using the Python programming language. Topics include: understanding Python; applying concepts of object-oriented design and programming by developing classes, methods, and properties using the principles of encapsulation, abstraction, inheritance, and polymorphism.
Prerequisites: IT 101 and IT 111 (minimum grade C for both)

CPDM 145 Data Reporting
4 Credits. 3 Lecture Hours. 3 Lab Hours.
A course on using Crystal Reports as the tool to design and deliver reports that include tables, charts, and graphs as part of a Web-based application linked to an SQL server database.
Prerequisites: IT 101, IT 110, IT 111 or CIT 110 (minimum grade C for all)

CPDM 151 ASP.NET C# 1
3 Credits. 2 Lecture Hours. 3 Lab Hours.
A course on the ASP.NET framework using C#. Topics include: introduction to C# language and syntax, Web forms, server controls, master pages, AJAX, and data driven applications.
Prerequisites: IT 101, IT 110, IT 111, (minimum grade C for all)

CPDM 152 ASP.NET C# 2
3 Credits. 2 Lecture Hours. 3 Lab Hours.
A continuation of CPDM 151. Topics include: advanced ASP.NET server controls, building custom classes, Web services, designing Web applications from abstract requirements, and effectively utilizing online reference materials.
Prerequisites: CPDM 151

CPDM 190 Cooperative Education Preparation: Computer Programming and Database Management
1 Credit. 1 Lecture Hour. 0 Lab Hour.
A course that prepares students in the CPDM program for cooperative education. Topics include: using the PlacePro software system, resume development, interview skills, and cooperative education requirements, policies and procedures.
Prerequisites: None

CPDM 191 Part-Time Cooperative Education 1: Computer Programming and Database Management
1 Credit. 1 Lecture Hour. 20 Lab Hours.
Students seeking an associate's degree participate in their first part-time field learning experience related to their degree. Students are expected to register for academic courses during the same semester. Students must follow cooperative education policies and procedures to earn credit. Grades issued are Satisfactory or Unsatisfactory.
Prerequisites: None

CPDM 192 Part-Time Cooperative Education 2: Computer Programming and Database Management
1 Credit. 1 Lecture Hour. 20 Lab Hours.
Students seeking an associate's degree participate in their second part-time field learning experience related to their degree. Students are expected to register for academic courses during the same semester. Students must follow cooperative education policies and procedures to earn credit. Grades issued are Satisfactory or Unsatisfactory.
Prerequisites: CPDM 191

CPDM 193 Part-Time Cooperative Education 3: Computer Programming and Database Management
1 Credit. 1 Lecture Hour. 20 Lab Hours.
Students seeking an associate's degree participate in their third part-time field learning experience related to their degree. Students are expected to register for academic courses during the same semester. Students must follow cooperative education policies and procedures to earn credit. Grades issued are Satisfactory or Unsatisfactory.
Prerequisites: CPDM 192

CPDM 194 Part-Time Cooperative Education 4: Computer Programming and Database Management
1 Credit. 1 Lecture Hour. 20 Lab Hours.
Students seeking an associate's degree participate in their fourth part-time field learning experience related to their degree. Students are expected to register for academic courses during the same semester. Students must follow cooperative education policies and procedures to earn credit. Grades issued are Satisfactory or Unsatisfactory.
Prerequisites: CPDM 193

CPDM 195 Part-Time Cooperative Education 5: Computer Programming and Database Management
1 Credit. 1 Lecture Hour. 20 Lab Hours.
Students seeking an associate's degree participate in their fifth part-time field learning experience related to their degree. Students are expected to register for academic courses during the same semester. Students must follow cooperative education policies and procedures to earn credit. Grades issued are Satisfactory or Unsatisfactory.
Prerequisites: CPDM 194

CPDM 196 Part-Time Cooperative Education 6: Computer Programming and Database Management
1 Credit. 1 Lecture Hour. 20 Lab Hours.
Students seeking an associate's degree participate in their sixth part-time field learning experience related to their degree. Students are expected to register for academic courses during the same semester. Students must follow cooperative education policies and procedures to earn credit. Grades issued are Satisfactory or Unsatisfactory.
Prerequisites: CPDM 195

CPDM 210 System Analysis and Design
3 Credits. 2 Lecture Hours. 3 Lab Hours.
A course on fundamental concepts in system analysis and design, within the framework of the system development life cycle. Topics include: business case analysis, requirement gathering, requirement modeling, enterprise modeling, and development strategies.
Prerequisites: None

CPDM 211 Business Application Development 1: RPGLE/DB2
4 Credits. 3 Lecture Hours. 3 Lab Hours.
A course on the IBM operating system and utilities, including DB2, Control Language, Query, SDA, and SQL. Topics include: RPGLE utilization of forms/specifications, language operation codes and special functions used to generate reports, and transaction-level file maintenance.
Prerequisites: IT 102

CPDM 212 Business Application Development 2: RPGLE/DB2
4 Credits. 3 Lecture Hours. 3 Lab Hours.
A continuation of CPDM 211. Topics include: RPGLE procedural programming including arrays/list processing, interactive applications, and subfiles; interactive and embedded SQL; and ILE programming through service programs to address introductory cross-platform programming.
Prerequisites: CPDM 211

CPDM 230 Mobile Application Development
4 Credits. 3 Lecture Hours. 3 Lab Hours.
A course on designing and programming applications for current mobile devices. Topics include: GUI programming application structure; and considerations related to networks, databases, video, GPS sensors, and multi-touch technology.
Prerequisites: IT 102

CPDM 240 Emerging Technologies: Web and Mobile Applications
4 Credits. 3 Lecture Hours. 3 Lab Hours.
A course on emerging technologies in software and applications development for the web and mobile devices.
Prerequisites: CPDM 230

CPDM 250 Game Design and Society
3 Credits. 2 Lecture Hours. 3 Lab Hours.
A course that examines the interdisciplinary natures of games and the fundamentals of game design. Topics include: history of games and play in society; game genres; game technical and experiential features; characteristics of game players; and creating game concepts, worlds, and characters.
Prerequisites: IT 117

CPDM 255 Web Game Development
3 Credits. 2 Lecture Hours. 3 Lab Hours.
A course on introductory programming for web games and similar interactive media using web programming languages such as JavaScript and HTML. Topics include: game programming frameworks, web programming syntax, web programming libraries for games, using a game loop, using sprites, interactive GUI programming, and creating the game environment.
Prerequisites: CPDM 250

CPDM 290 Computer Programming and Database Management Capstone
3 Credits. 2 Lecture Hours. 3 Lab Hours.
Students work on a team project that demonstrates mastery of skills gained throughout their degree studies. Topics include: developing a project idea, conducting a feasibility study for the idea, gathering and analyzing requirements, and designing and implementing a solution.
Prerequisites: IT 218 or IT 262 or SET 252 or program chair consent
Instructor Consent Required

CPDM 291 Full-Time Cooperative Education 1: Computer Programming and Database Management
2 Credits. 1 Lecture Hour. 40 Lab Hours.
Students seeking an associate's degree participate in their first full-time field learning experience related to their degree. Students must follow cooperative education policies and procedures to earn credit. Grades issued are Satisfactory or Unsatisfactory.
Prerequisites: None

CPDM 292 Full-Time Cooperative Education 2: Computer Programming and Database Management
2 Credits. 1 Lecture Hour. 40 Lab Hours.
Students seeking an associate's degree participate in their second full-time field learning experience related to their degree. Students must follow cooperative education policies and procedures to earn credit. Grades issued are Satisfactory or Unsatisfactory.
Prerequisites: CPDM 291

CPDM 293 Full-Time Cooperative Education 3: Computer Programming and Database Management
2 Credits. 1 Lecture Hour. 40 Lab Hours.
Students seeking an associate's degree participate in their third full-time field learning experience related to their degree. Students must follow cooperative education policies and procedures to earn credit. Grades issued are Satisfactory or Unsatisfactory.
Prerequisites: CPDM 292

CPDM 294 Internship 1: Computer Programming and Database Management
2 Credits. 1 Lecture Hour. 40 Lab Hours.
Students seeking an associate's degree participate in their first unpaid field learning experience related to their degree. Students must follow applicable policies and procedures to earn credit. Grades issued are Satisfactory or Unsatisfactory.
Prerequisites: CPDM 190

CPDM 295 Internship 2: Computer Programming and Database Management
2 Credits. 1 Lecture Hour. 40 Lab Hours.
Students seeking an associate's degree participate in their second unpaid field learning experience related to their degree. Students must follow applicable policies and procedures to earn credit. Grades issued are Satisfactory or Unsatisfactory.
Prerequisites: CPDM 294

CPDM 296 Project-Based Learning 1
2 Credits. 1 Lecture Hour. 40 Lab Hours.
Students seeking an associate's degree participate in their first full-time project-based learning experience related to their degree. Grades issued are Satisfactory or Unsatisfactory.
Prerequisites: IT 102

CPDM 297 Project-Based Learning 2
2 Credits. 1 Lecture Hour. 40 Lab Hours.
Students seeking an associate's degree participate in their second full-time project-based learning experience related to their degree. Grades issued are Satisfactory or Unsatisfactory.
Prerequisites: CPDM 296 or CPDM 291

IT Courses

IT 100 Computer Programming Foundations
3 Credits. 2 Lecture Hours. 3 Lab Hours.
A course on fundamental concepts related to computer programming. Topics include: problem solving and developmental tools, design techniques such as flow charting and pseudo coding, and testing techniques used in programming.
Prerequisites: Placement into ENG 101A

IT 101 Programming 1
3 Credits. 2 Lecture Hours. 3 Lab Hours.
An introduction to software development. Topics include: application design methods, application testing methods, the sequential structure of programming, the conditional structure of programming, variables, and modular programming concepts using procedures and functions.
Prerequisites: Placement into ENG 101A MAT 093 or MAT 131A or appropriate Math placement

IT 102 Programming 2
3 Credits. 2 Lecture Hours. 3 Lab Hours.
A continuation of IT 101. Topics include: the iterative programming structure, database programming, array processing, and string manipulation techniques.
Prerequisites: IT 101 and IT 111 (minimum grade C for both)

IT 103 .NET Programming 3
3 Credits. 2 Lecture Hours. 3 Lab Hours.
A continuation of IT 102. Topics include: creating, debugging, and maintaining web-based database applications using the .NET framework.
Prerequisites: IT 102 and IT 111

IT 105 Information Technology Concepts
3 Credits. 2 Lecture Hours. 3 Lab Hours.
A course on information technology fundamentals. Topics include: the internet, software, hardware, input/output (I/O) and storage, operating systems, communications and networks, database management, security, system development, programming, enterprise computing, and numbering systems. The course is delivered through online instruction only.
Prerequisites: FYE 120 or placement into ENG 101 MAT 093 or MAT 105A or appropriate Math placement

IT 110 HTML with CSS and JavaScript
3 Credits. 2 Lecture Hours. 3 Lab Hours.
A course on internet programming using HTML, CSS, and JavaScript. Topics include: HTML commands, cascading style sheets, JavaScript commands, web applications (apps), and dynamic web pages.
Prerequisites: None

IT 111 Database Design and SQL 1
3 Credits. 2 Lecture Hours. 3 Lab Hours.
A course on fundamentals of relational database design and implementation using Microsoft SQL Server. Topics include: SQL Enterprise Manager, fundamentals of database design and normalization, data import and export, Structured Query Language (SQL), indexes and keys, views, and stored procedures.
Prerequisites: ENG 085 or appropriate placement MAT 093 or appropriate placement

IT 112 Database Design and SQL 2
3 Credits. 2 Lecture Hours. 3 Lab Hours.
A continuation of IT 111. Topics include: advanced stored procedures using transact SQL, user defined functions, triggers, user defined data types, full text searching, replication, database maintenance plans, and designing data models from abstract requirements.
Prerequisites: IT 111 (minimum grade C)

IT 115 Operating Systems Administration 1
3 Credits. 2 Lecture Hours. 3 Lab Hours.
A course on the Windows operating system used on PCs. Topics include Windows utilization and management, utilities, managing disks, disaster recovery, troubleshooting, user management, productivity tools, and performance issues. This course prepares students for a Microsoft Certification exam.
Prerequisites: FYE 120 or placement into ENG 101

IT 116 Operating Systems Administration 2
3 Credits. 2 Lecture Hours. 3 Lab Hours.
A continuation of IT 115. Topics include: managing software problems; managing virtualization; cloud computing; and client configuration, development, deployment, and security. This course prepares students for a CompTIA Cloud+ Certification exam.
Prerequisites: IT 115 (minimum grade C)

IT 117 Web Application Development 1
3 Credits. 2 Lecture Hours. 3 Lab Hours.
A course on fundamentals of web-based application development. Topics include: current front-end and back-end technologies used to develop business-related applications, and understanding infrastructure to support application development.
Prerequisites: IT 102 and CPDM 120 (minimum grade C for both)

IT 118 Web Application Development 2
3 Credits. 2 Lecture Hours. 3 Lab Hours.
A continuation of IT-117. Topics include: using current front-end and back-end technologies to develop business-related applications.
Prerequisites: IT 117

IT 140 PHP and MySQL
4 Credits. 3 Lecture Hours. 3 Lab Hours.
A course in PHP web programming with a MySQL database. Topics include: PHP language, syntax, variables, and forms; MySQL database design; connecting to a MySQL database using PHP; inserting, editing, and deleting MySQL data using PHP; and building dynamic web pages using PHP and MySQL.
Prerequisites: IT 101 and IT 110

IT 150 Logistics and Distribution Technology
3 Credits. 2 Lecture Hours. 2 Lab Hours.
A course on technologies and software used in supply chain management for freight, air, and maritime logistics operations. Topics include: barcodes, radio-frequency identification (RFID), Wi-Fi tags, logistics and inventory software, high frequency tracking, and passive/active tracking.
Prerequisites: None

IT 161 Java Programming 1
3 Credits. 2 Lecture Hours. 3 Lab Hours.
A course on fundamentals of the Java programming language. Topics include: data types, variables, basic command line input/output, decisions, loops, procedures, string manipulation, arrays, object-oriented development, event programming, and database programming.
Prerequisites: CPDM 120 and IT 102 (minimum grade C for both)

IT 162 Java Programming 2
3 Credits. 2 Lecture Hours. 3 Lab Hours.
A continuation of IT 161. Topics include: Java Server Pages (JSP) and complex database applications using Java and JSP.
Prerequisites: IT 161

IT 212 Business Intelligence, Data Warehousing, and Reporting
3 Credits. 2 Lecture Hours. 3 Lab Hours.
A course on concepts, technologies, and techniques used to effectively consolidate, arrange, and analyze large amounts of data. Topics include: decision support systems, data mining, and how to derive business value from large amounts of data.
Prerequisites: IT 112

IT 215 Scripting
3 Credits. 2 Lecture Hours. 2 Lab Hours.
A course on task automation and configuration management using Python programming language. Topics include: modifying existing Python scripts, and creating new scripts to automate common tasks. The course is delivered through online instruction only.
Prerequisites: NETA 155

IT 218 Web Application Development 2
3 Credits. 2 Lecture Hours. 3 Lab Hours.
A continuation of IT 117. Topics include advanced front-end and back-end processing to develop advanced web-based applications.
Prerequisites: IT 117

IT 220 Emerging Topics in Computer Software Development
3 Credits. 2 Lecture Hours. 3 Lab Hours.
A course on current topics related to Computer Software Development such as data reporting, XML, and other new concerns.
Prerequisites: IT 101, IT 110, IT 111

IT 262 Java Programming 2
3 Credits. 2 Lecture Hours. 3 Lab Hours.
A continuation of IT 161, with focus on completing complex projects using Java and associated technologies.
Prerequisites: IT 161