Software Engineering Technology Major (SET)

Computer Programming and Database Management - Software Engineering Technology Major (SET)

The Computer Programming and Database Management - Software Engineering Technology Major (SET) focuses 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, and select a technical concentration to enhance their technical skills. Students also gain knowledge of core math and science concepts and skills.

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 engineering, engineering technology, mathematics, or computer science.

Although some required courses are available through evening and/or online classes, most of the required courses for the Software Engineering Technology Major are scheduled on Monday through Friday between 8 a.m. and 5 p.m.

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 Programming and Database Management - Software Engineering Technology Major (SET)

Semester 1		**Lec**	**Lab**	**Credits**
FYE 1XX First Year Experience Elective (**B**)		1	0	1
ENG 101	English Composition 1 (**G**)	3	0	3
MAT XXX Mathematics Elective (**G**)		3	0	3
IT 100	Computer Programming Foundations (**B**)	2	3	3
XXX XXX Arts/ Humanities Elective (**G**)		3	0	3
Semester 2				
IT 101	Programming 1 (**B**)	2	3	3
IT 111	Database Design and SQL 1 (**B**)	2	3	3
XXX XXX Software Engineering Technology Elective 1 (**B**)		3	3	4
CPDM 210	System Analysis and Design (**T**)	2	3	3
Semester 3				
IT 102	Programming 2 (**T**)	2	3	3
CPDM 120	Fundamentals of Object-Oriented Programming using Python (**T**)	2	3	3
XXX XXX Software Engineering Technology Elective 2 (**B**)		3	3	4
ECO 1XX Economics Elective (**G**)		3	0	3
Semester 4				
XXX XXX Experiential Learning Elective 1 (**T**)		1	40	2
XXX XXX Technical Concentration Elective 1 (**T**)		2	3	3
XXX XXX Technical Track Elective 1 (**T**)		2	3	3
Semester 5				
XXX XXX Software Engineering Technology Elective 3 (**B**)		3	3	4
XXX XXX Technical Concentration Elective 2 (**T**)		2	3	3
XXX XXX Technical Track Elective 2 (**T**)		2	3	3
ENG 10X English Composition Elective (**G**)		3	0	3
Semester 6				
XXX XXX Experiential Learning Elective 2 (**T**)		1	40	2

CPDM 290	Computer Programming and Database Management Capstone (**T**)	2	3	3
Total Credits:		**49**	**122**	**65**

Electives

First Year Experience Elective		
FYE 100	College Success Strategies: Overview	1
FYE 105	College Success Strategies: Overview and Application	2
FYE 110	College Success Strategies: Practice and Application	3
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
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
Arts/Humanities Elective		
Any Transfer Module course from ART, LIT, MUS, PHI, REL, THE, or COMM 130		
Economics Elective		
ECO 105	Principles of Microeconomics	3
ECO 110	Principles of Macroeconomics	3
Experiential Learning Electives (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 296	Project-Based Learning 1	2
CPDM 297	Project-Based Learning 2	2
Software Engineering Technology Electives (Choose 3 courses)		
BIO 131	Biology 1	5
CHE 110	Fundamentals of Chemistry	4
CHE 111	Bio-Organic Chemistry	4
MAT 126	Functions and Calculus	4
MAT 251	Calculus 1	5
MAT 252	Calculus 2	5
PHY 151	Physics 1: Algebra and Trigonometry-Based	4
PHY 152	Physics 2: Algebra and Trigonometry-Based	4
Technical Concentration Electives (Choose 1 concentration)		
C Programmer Concentration		
SET 151	C Programming 1 (**T**)	3
SET 252	C Programming 2 (**T**)	3
Java Programmer Concentration		
IT 161	Java Programming 1 (**T**)	3
IT 262	Java Programming 2 (**T**)	3
Web Programmer Concentration		
IT 117	Web Application Development 1 (**T**)	3
IT 218	Web Application Development 2 (**T**)	3
Technical Track Electives (Choose 1 track)		
C Programming Track		
SET 151	C Programming 1 (**T**)	3
SET 252	C Programming 2 (**T**)	3
Java Programming Track		
IT 161	Java Programming 1 (**T**)	3
IT 262	Java Programming 2 (**T**)	3
Web Programming Track		
IT 117	Web Application Development 1 (**T**)	3
IT 218	Web Application Development 2 (**T**)	3
IBMi Powersystem Track		
CPDM 211	Business Application Development 1: RPGLE/DB2 (**T**)	4
CPDM 212	Business Application Development 2: RPGLE/DB2 (**T**)	4
Mobile Application Track		
CPDM 230	Mobile Application Development (**T**)	4
CPDM 240	Emerging Technologies: Web and Mobile Applications (**T**)	4
Computer Networking Track		
NETC 121	Network Communications 1 (**T**)	3
NETC 122	Network Communications 2 (**T**)	3
Database Analytics Track		
IT 112	Database Design and Management (**T**)	3
IT 212	Business Intelligence, Data Warehousing, and Reporting (**T**)	3
Game Development Track		
CPDM 250	Game Design and Society (**T**)	3
CPDM 255	Web Game Development (**T**)	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.

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 Programming and Database Management (CIS, 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 the 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.

Faculty

Program Chair/Advisor

Robert (Bob) Nields, MBA
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Co-op Coordinator

Kimberly Richards, EdD
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Engineering and Information Technologies Division Advising

(513) 569-1743

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, and 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, and 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 and MAT 093, or appropriate placements

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; and client configuration, development, deployment, and security. This course prepares students for a Microsoft 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

SET Courses

SET 110 HTML for Programmers
3 Credits. 2 Lecture Hours. 3 Lab Hours.
A course on client-side web development from a programmer's perspective. Topics include: HTML, JavaScript, cascading style sheets (CSS), the document object model (DOM), dynamic HTML (DHTML), and regular expressions.
Prerequisites: None

SET 151 C Programming 1
3 Credits. 2 Lecture Hours. 3 Lab Hours.
A course on fundamentals of the C computer programming language. Topics include: decision statements, loops, functions, arrays, strings, structures, pointers, and dynamic memory allocation.
Prerequisites: IT 102 and CPDM 120 (minimum grade C for both)

SET 191 Part-Time Cooperative Education 1: Software Engineering Technology
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

SET 192 Part-Time Cooperative Education 2: Software Engineering Technology
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: SET 191

SET 193 Part-Time Cooperative Education 3: Software Engineering Technology
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: SET 192

SET 194 Part-Time Cooperative Education 4: Software Engineering Technology
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: SET 193

SET 195 Part-Time Cooperative Education 5: Software Engineering Technology
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: SET 194

SET 196 Part-Time Cooperative Education 6: Software Engineering Technology
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: SET 195

SET 252 C Programming 2
3 Credits. 2 Lecture Hours. 3 Lab Hours.
A continuation of SET 151, using the C++ computer programming language. Topics include: classes, object-oriented programming techniques, polymorphism, inheritance, encapsulation, pointers, memory management, overloading, templates, and advanced data structures.
Prerequisites: SET 151

SET 253 C Programming 3
3 Credits. 2 Lecture Hours. 3 Lab Hours.
A continuation of SET 252, using the C# computer programming language. Topics include: program design, database programming techniques using stored procedures, and views with SQL Server.
Prerequisites: IT 111 and SET 252

SET 290 Software Engineering Technology Capstone
3 Credits. 1 Lecture Hour. 4 Lab Hours.
Students apply their programming and database skills to complete a software application.
Prerequisites: IT 103 and IT 111 and SET 252

SET 291 Full-Time Cooperative Education 1: Software Engineering Technology
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

SET 292 Full-Time Cooperative Education 2: Software Engineering Technology
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: SET 291

SET 293 Full-Time Cooperative Education 3: Software Engineering Technology
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: SET 292

SET 294 Internship 1: Software Engineering Technology
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: CIT 190

SET 295 Internship 2: Software Engineering Technology
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: SET 294