Atlantic Technical College
Database Application Development & Programming
High School Only
Program Syllabus
2020-2021

Instructor Name: Chandrakasan Iyar
Department Name: Business and Information Technology
Office/Classroom Location: Building 7, Room 176
Phone Number: (561) 444-8121 (Google Voice)
Email Address: chandrakasan.iyar@browardschools.com

Instructor Office Hours:
M-F: 6:45 am – 7:30 am & 2:15 – 3:45 pm (appointment preferred)
Instructor responses to student requests will be provided within 24 hours of regular school operating hours: Monday – Friday 7:00 am – 3:00 pm.

Student Hours:
Monday – Friday
High School AM: 7:30 am – 10:35 am
High School PM: 11:10 am – 2:15 pm
Lunch: 10:35 am – 11:05 am

Program Name: Database Application Development & Programming

OCPs	Course Names	Hours
A	OTA0040 Information Technology Asst.	150
B	CTS0041 Computer Programmer Assistant	300
C	CTS0044 Computer Programmer	150
D	CTS0062 Database Programmer	600

Course Description:
This program is designed to prepare students for employment as database programmers, computer programmer assistants, and computer programmers, or to provide supplemental training for persons previously or currently employed in these occupations.

The fundamentals of programming and software development; procedural and object-oriented programming; creating regular and specialized applications using standard and extended Structured Query Language (SQL), PL/SQL and JavaScript including testing, monitoring, debugging, documenting and maintaining database applications are taught. After successfully completing this program, students will be able to design database models and utilize computer programming languages to create and manipulate databases. The student will also have developed skills in mathematical applications, communications, information processing concepts, designing programs, coding programs, testing programs, performing program maintenance, and debugging programs

Technical College Policy/Adult Student Attendance:

- A student must be withdrawn after being absent for six (6) consecutive days.
- Two (2) additional absences may be allowed under certain circumstance with appropriate documentation.
- Please refer to the Student Handbook for postsecondary students. http://www.atlantictechnicalcollege.edu/atc-student-handbook/

Magnet High School/Attendance Policy:

A student who has had at least five unexcused absences, or absences for which the reasons are unknown, within a calendar month, or 10 unexcused absences, or absences for which the reasons are unknown, within a 90-calendar-day period, may be exhibiting a pattern of non-attendance according to (F.S.1003.26 (1) (b)) and the School Board of Broward County, Policy 5.5.

Required Book(s) and/or Online Access:
Provided by School:

- Starting Out with Programming Logic and Design 4e
- CIW JavaScript Specialist Electronic Student Kit
- Oracle Academy Access
- Cisco Academy Access

Required Materials/Supplies:
Purchased from ATC Bookstore:

- Paper, pencils and pens
- Headset with microphone

All required books and most materials/supplies can be purchased from the ATC bookstore.
Stop by during operational hours for pricing, booklist and other purchasing information.

Grading System:

A 90 - 100%
B 80 - 89%
C 70 - 79%
D 60 - 69%
F 0 - 59%
I Incomplete

Additional Program Specific Grading Information:

- Daily/Classwork 30%
- Quizzes/Tests 30%
- Projects/Labs 30%
- Work Habits 10%

Online Course Grading Policy:
Online students' grades and attendance are based on the following:

- Scheduled assignments are due each **Sunday by 11:59 pm**. Late submission of work will affect the assignment grade.
- Students assume full responsibility for the content and integrity of submitted work. As the guiding principle of academic integrity, a student's submitted work, examinations, reports, projects, etc. must be his/her own.
- Unless otherwise stated by the instructor, physical or digital references including books, charts, graphs, diagrams, photos, notes or calculators may not be utilized during assessments or exams. Blank scratch paper will be permitted during certain assessments.
- Exams may include an oral or lab/skills component and final exams will be completed in-person during a lab session.

View Your Grades:

Grades can be viewed online by following the directions below:

1. Go to Clever SSO Website link: https://sso.browardschools.com and login:
   a. Username: 10-digit student ID number
   b. Password: PMM/DD/YYYY (or your personally created password after initial login)
2. Click on the FOCUS app on your Clever opening page.
   (You may need to scroll-down the page to see the FOCUS app.)
3. Enter your FOCUS username and password.
   NOTE: If the Focus App. is not visible after logging into Clever, please navigate to the Broward Focus website directly: https://broward.focusschoolsoftware.com/focus/.

Classroom/Lab Rules:

- Sign in and out DAILY.
- Read and follow DAILY AGENDA upon arrival.
- Follow all rules in the student and discipline code books.
- Cell phones silent or OFF and PUT AWAY.
- Contact instructor by 8:00 am on the same day when absent (email preferred).
- Come to class prepared to work and be respectful of ALL class members.
- ALL assignments submitted to instructor must reflect the student's own individual work.
- **NO FOOD OR BEVERAGES IN THE LAB.**

Industry Certification & State Credential Exams:

- MTA Database Administration Fundamentals
- CIW JavaScript Specialist

You may qualify for certification reimbursement of your exam cost(s) upon passing. Credential fees are subject to change.

Outstanding Student Recognition Information:
A gold seal will be applied to a Program Completion Certificate or an Applied Technology Diploma if the student has earned a 3.5 GPA or higher in their Career and Technical Education (CTE) classes.

Program Name: Database Application Development and Programming

Course Number: OTA0040
Course Name: Information Technology Assistant (150 Hours)
Occupational Completion Point: A
Intended Outcomes: (From FL DOE Curriculum Framework)

Student will be able to:

- Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance.
- Develop an awareness of microprocessors and digital computers.
- Demonstrate an understanding of operating systems.
- Use technology to enhance the effectiveness of communication skills utilizing word processing applications.
- Use technology to enhance communication skills utilizing presentation applications.
- Use technology to enhance the effectiveness of communication utilizing spreadsheet and database applications.
- Use technology to enhance communication skills utilizing electronic mail.
- Investigate individual assessment and job/career exploration and individual career planning that reflect the transition from school to work, lifelong learning, and personal and professional goals.
- Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance.
- Demonstrate competence using computer networks, internet and online databases to facilitate collaborative or individual learning and communication.
- Demonstrate competence in page design applicable to the WWW.
- Develop an awareness of emerging technologies.
- Develop awareness of computer languages and software applications.
- Demonstrate comprehension and communication skills.

Course Number: CTS0041
Course Name: Computer Programmer Assistant (300 Hours)
Occupational Completion Point: B
Intended Outcomes: (From FL DOE Curriculum Framework)

Student will be able to:

- Use oral and written communication skills in creating, expressing and interpreting information and ideas.
- Explore the characteristics, tasks, work attributes, options, and tools associated with a career in software development.
- Demonstrate an understanding of the characteristics, use, and selection of numerical, non-numerical, and logical data types.
- Distinguish between iterative and non-iterative program control structures.
- Differentiate among high level, low level, procedural, object-oriented, compiled, interpreted, and translated programming languages.

- Describe the processes, methods, and conventions for software development and maintenance.
- Explain the types, uses, and limitations of testing for ensuring quality control.
- Create a program design document using Unified Modeling Language (UML) or other common design tool.
- Solve problems using critical thinking skills, creativity and innovation.
- Use information technology tools.
- Describe the importance of security and privacy information sharing, ownership, licensure and copyright.
- Design a computer program to meet specific physical, operational, and interaction criteria.
- Create and document a computer program that uses a variety of internal and control structures for manipulating varied data types.
- Create and document an interactive computer program that employs functions, subroutines, or methods to receive, validate, and process user input.
- Effectively communicate and collaborate.
- Demonstrate responsible use of technology and information.

Course Number: CTS0044
Course Name: Computer Programmer Assistant (150 Hours)
Occupational Completion Point: C
Intended Outcomes: (From FL DOE Curriculum Framework)

Student will be able to:

- Explain key concepts that distinguish object-oriented programming from procedural programming.
- Create a project plan that defines requirements, structural design, time estimates, and testing elements.
- Design, document, and create object-oriented computer programs.
- Design a unit test plan for an object-oriented computer program, test and debug the program, and report the results.
- Understand human interactions in intelligence.

Course Number: CTS00620
Course Name: Database Programmer (600 Hours)
Occupational Completion Point: D
Intended Outcomes: (From FL DOE Curriculum Framework)

Student will be able to:

- Develop an awareness of the changes taking place in the information age and how they fit into an evolving society.
- Develop the "big picture" of database design and how to best organize data according to business rules and/or client needs.
- Develop the process of creating an entity by identifying relationships.
- Formulate and assemble initial entity relationship by expanding on modeling concepts.

- Consider the degree and optionality of relationships of entities.
- Demonstrate proficiency in early construction stages of the data modeling process by using unique identifiers and many-to-many (M:M) relationships for building entity relationship diagrams.
- Demonstrate proficiency in advanced data constructs by analyzing business requirements and diagramming entities and relationships.
- Demonstrate proficiency in designing and adding complexity to an entity-relationship model (ERM).
- Apply complex ERM information by fine-tuning entities and the process for relating them.
- Apply initial database design and normalization by following the set of house rules that determine how items are stored and retrieved.
- Demonstrate proficiency in the technique of normalization by labeling and organizing all items in a database in such a way as to prevent any confusion or mistakes.
- Demonstrate proficiency in table normalization by combining the techniques of an entity relationship model or a top-down, business approach to data with normalization or a bottom-up mathematical approach to data.
- Apply blueprint principles to begin designing a tool for creating a web-based interface access to a database.
- Extend the logical model presentation model by normalizing the data and mapping the management system.
- Apply techniques for building a storage management system by creating a website using templates and wizards.
- Demonstrate design and functionality by constructing a group business presentation.
- Demonstrate comprehension of database modeling competency through group presentation.
- Demonstrate comprehension that the database management software is a system for organizing the storage unit (or database) according to business needs and rules, through data integrity constraints.
- Demonstrate comprehension of aspects of SQL language interface by writing basic SQL statements.
- Demonstrate proficiency working with columns, characters, and rows in SQL.
- Demonstrate proficiency in using SQL comparison operators.
- Demonstrate proficiency in using logical comparisons and precedence rules.
- Demonstrate proficiency using SQL single row functions.
- Demonstrate proficiency displaying data from multiple tables.
- Demonstrate proficiency aggregating data using group functions.
- Demonstrate proficiency utilizing subqueries.
- Demonstrate proficiency producing readable output with SQL language interface, reporting tool, and data manipulation language.
- Demonstrate proficiency creating and managing database objects.
- Demonstrate proficiency altering tables and constraints implementing views.
- Demonstrate mastery of creating and implementing views, synonyms, indexes and other database objects.

- Demonstrate ability to control user access and SQL language interface and reporting tool.
- Demonstrate comprehension of bundling features of SQL.
- Demonstrate comprehension working with composite data types by writing executable script files.
- Describe the differences between SQL and SQL extension languages.
- Create program blocks.
- Use variables in program blocks.
- Recognize lexical units.
- Recognize data types.
- Use scalar data types.
- Use various types of joins.
- Use SQL group functions and subqueries.
- Write executable statements.
- Use nested blocks and variable scope.
- Use good programming practices.
- Write DML statements to manipulate data.
- Retrieve data.
- Manipulate data.
- Use transaction control statements
- Use IF conditional control statements.
- Use CASE conditional control statements.
- Use basic LOOP iterative control statements.
- Use WHILE and FOR loop iterative control statements.
- Use nested loop iterative control statements.
- Use explicit cursors.
- Use explicit cursor attributes.
- Use cursor FOR loops.
- Use cursors with parameters.
- Use cursors for update transactions.
- Use multiple cursors.
- Handle exceptions.
- Trap server exceptions.
- Trap user-defined exceptions.
- Create procedures.
- Use parameters in procedures.
- Pass parameters.
- Create stored functions.
- Use functions in SQL statements.
- Manage procedures and functions.
- Manage object privileges.
- Use invoker's rights.
- Create packages.
- Manage package constructs.
- Use advanced package concepts.

- Manage persistent state of package variables.
- Use vendor-supplied packages.
- Understand dynamic SQL.
- Understand triggers.
- Create DML triggers.
- Create DDL and database event triggers.
- Manage triggers.
- Use large object data types.
- Manage binary types.
- Manage indexes.
- Manage dependencies.
- Demonstrate an understanding of Agile Development.
- Program a database application.
- Utilize the basic concepts of database design.
- Utilize SQL and union queries.
- Implement program statements using objects.
- Utilize debugging tools and write error handlers.
- Demonstrate file I/O.
- Create forms and identify all the properties of a form.
- Manipulate data using object models.
- Develop custom controls.
- Utilize API functions.
- Demonstrate and implement database replication using programming tools.
- Analyze and implement security options.
- Implement client/server applications.
- Optimize the performance of a database.
- Perform application distribution.
- Test and debug databases.
- Describe the difference between relational and NoSQL databases.
- Demonstrate an understanding of Data Science and the concept of Data mining.