# COMPUTER INFORMATION SYSTEMS TECHNOLOGY (BAS), AI-ENHANCED DATA SCIENCE SPECIALIZATION

**Previous Degree Required:** A.S./A.A.
**Eligible for Financial Aid:** Yes
**Delivery Method(s):** On-Campus, Hybrid, Online
**Location(s):** Melbourne, Online
**Limited Access:** No
**Program Testing Requirements:** Not Required
**Academic Community:** STEM
**Program Code:** CTBSDSBS
**Classification of Instructional Programs (CIP) Code:** 11.0401
**Florida Department of Education CIP Code:** 1101104011

This is a specialization of the BAS Computer Information Systems Technology degree.

In the AI (Artificial Intelligence)-Enhanced Data Science BAS Specialization, you will gain a solid understanding of data science essentials, as well as learn about the importance of data security.

This BAS track offers flexibility as you manage school and life commitments, with the freedom to choose between online and hybrid courses that blend online and face-to-face learning.

In order to begin upper-level courses, students will need to earn a grade of "C" or higher in these two courses: COP 2334: Introduction to C++ Programming and STA 2023: Statistics. If you haven't taken these before entering the program, an EFSC advisor can help with course planning.

As part of the “AI-Enhanced Data Science” coursework, there are 1000 and 2000 level math & AI courses required.  The 1000 and 2000 level courses required for this specialization include the following:

- MAT 1033 Intermediate Algebra
- MAC 1105 College Algebra
- MAC 1233 Essentials of Calculus
- CAI 1001 AI Thinking
- CAIC 2100 Machine Learning Foundations
- COP 2047 Python Programming

In addition, the 1000 and 2000 level technical course prerequisites for the “Specialization Electives” include the following.

- CGS 2100 Microcomputer Applications
- COP 2700 Database Techniques

Please coordinate with an EFSC advisor prior to registering for the “Specialization Electives”.

Refer to the Bachelor of Applied Science (BAS) overview page to find information about admission, graduation, general education and other requirements. Students who need technical electives will work with a bachelor’s advisor to determine the courses best suited to their plan of study.

Visit the program page for more information.

## Program of Study

| Code | Title | Credit Hours |
|---|---|---|
| **Associate Degree** | | **60** |
| Credits earned from Associate Degree | | |
| **General Education or Technical Concentration** | | **21** |
| Credits from General Education (for A.S. degree students) or Technical Concentration (for A.A. degree students) | | |
| **Computer Information Systems Technology Major Courses** | | |
| GEB 3213 | Foundations of Managerial Communications | 3 |
| ISM 3011 | Introduction to Information Technology Management | 3 |
| ISM 4300 | Information Systems Operations Management | 3 |
| MAN 4504 | Operational Decision Making | 3 |
| **AI-Enhanced Data Science Specialization Courses** | | |
| CAIC 3821 | Computational Methods & Applications 1 | 3 |
| CAIC 3822 | Computational Methods & Applications 2 | 3 |
| CAP 4770 | Data Mining | 3 |
| COP 3530 | Data Structures and Algorithm Analysis | 3 |
| CAP 4773 | Capstone Project - Data Management Science | 3 |
| STA 3024 | Statistics 2 for Data Scientists | 3 |
| **AI-Enhanced Data Science Specialization Electives** | | **9** |
| Select 9 credits from the following: | | |
| CAP 3783 | Database Systems with Big Data | |
| CEN 4949 | Internship | |
| COP 3330 | Object Oriented Programming | |
| COP 3703 | Database Design and Architecture | |
| ISM 3113 | Information Systems Analysis and Design | |
| ISM 3324 | Applications in Information Security | |
| **Total Hours:** | | **120** |

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In accordance with Florida Statute and Florida Administrative
 Code, students must
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- `Satisfy the foreign language competency requirement`
- `Satisfy the Civic Literacy Graduation Requirement.`

The BAS in Computer Information Systems Technology has two **Common Program Prerequisites.** These courses must be completed with a grade of "C" or higher before being admitted to 3000 - 4000 level courses:

- COP 2334 Introduction to C++ Programming
  - Any Computer Programming course with a COP prefix will be accepted in place of COP 2334, except COP 1000 Principles of Programming
- STA 2023 Statistics
  - MAC 2311 Calculus 1 with Analytic Geometry will be accepted in place of STA 2023. No other course substitutions are permitted for either course. Click on the course number to see course prerequisites.

## Course Sequence

Below is the recommended sequence for taking the bachelor's-level courses in this degree. Using this guide and meeting with your assigned advisor each term is the key to successful program completion.

Please note that course prerequisites, including required developmental math, reading, or writing, need to be completed to continue on to the more advanced course. Courses followed by "&" have prerequisites that are not part of this program. Click on the course number to see the requirements.

| Code | Title | Credit Hours |
|---|---|---|
| Tech or Gen Ed Elective [1] | | 3 |
| Tech or Gen Ed Elective [1] | | 3 |
| GEB 3213 | Foundations of Managerial Communications | 3 |
| ISM 3011 | Introduction to Information Technology Management | 3 |
| COP 3530 | Data Structures and Algorithm Analysis | 3 |
| Tech or Gen Ed Elective [1] | | 3 |
| ISM 4300 | Information Systems Operations Management [&] | 3 |
| MAN 4504 | Operational Decision Making | 3 |
| CAP 4770 | Data Mining [Sp] | 3 |
| STA 3024 | Statistics 2 for Data Scientists [&] | 3 |
| Tech or Gen Ed Elective [1] | | 3 |
| CAIC 3821 | Computational Methods & Applications 1 [Fa, &] | 3 |
| Specialization Elective [2] | | 3 |
| Specialization Elective [2] | | 3 |
| Specialization Elective [2] | | 3 |
| Tech or Gen Ed Elective [1] | | 3 |
| Tech or Gen Ed Elective [1] | | 3 |
| Tech or Gen Ed Elective [1] | | 3 |
| CAIC 3822 | Computational Methods & Applications 2 [Sp] | 3 |
| CAP 4773 | Capstone Project - Data Management Science | 3 |
| **Total Hours:** | | **60** |

[1] Select 21 credits to meet the general education requirement or technical elective requirement. Work with a bachelor's advisor to determine the courses needed.

[2] Select 15 credits from the Data Science Specialization electives list on the Program of Study page.

Fa Course is offered only in Fall term

Sp Course is only offered in Spring term

* *Course offering schedules may be subject to change.*

Listed below are the approved courses that satisfy the Technical Concentration requirement for your degree program. Students must select their courses only from this designated list.

Please note that a single course may not be used to fulfill more than one requirement. For example, a course applied toward Technical Concentration cannot also be used as a Specialization course or applied to any other category.

Before finalizing your selections, be sure to confirm that you have not previously completed any of the courses you intend to use to meet the Technical Concentration. Work with a bachelor's advisor to determine the courses best suited to your plan of study.

| Code | Title | Credit Hours |
|---|---|---|
| CET 1176 | Computer Maintenance and Repair | 3 |
| CET 2894 | Capstone in Cybersecurity | 3 |
| CETC 1114 | Digital Fundamentals | 4 |
| CETC 1123 | Microprocessor Fundamentals | 4 |
| CETC 2890 | Cybersecurity | 3 |
| COP 1000 | Principles of Programming | 3 |
| COP 1657 | Introduction to Mobile Applications Programming | 3 |
| COP 2334 | Introduction to C++ Programming | 3 |
| COP 2335 | C++ Programming Advanced | 3 |
| COP 2360 | C Sharp Programming | 3 |
| COP 2362 | C Sharp Programming Advanced | 3 |
| COP 2671 | Mobile Applications Development | 3 |
| COP 2700 | Database Techniques | 3 |
| COP 2800 | Introduction to Java Programming | 3 |
| COP 2805 | Advanced Java Programming | 3 |
| COP 2812 | Introduction to XML | 3 |
| COP 2822 | Web Page Authoring | 3 |
| CTS 1142 | Information Technology Project Management | 3 |
| CTS 1154 | Help Desk Technical Support | 3 |
| CTS 1155 | Help Desk Customer Support | 3 |
| CTS 1321 | Linux Networking and System Administration | 3 |
| CTS 1329 | Microsoft Client O/S | 3 |
| CTS 1383 | Microsoft Server O/S - Installation and Configuration | 3 |
| CTS 2370 | Virtual Infrastructure- Planning and Design | 3 |
| CTS 2371 | Virtual Computing- Deployment, Security, and Analysis (VMware) | 3 |
| CTS 2440 | Introduction to Oracle SQL and PL/SQL | 3 |
| CTS 2441 | Oracle Database Fundamentals 1 | 3 |
| CTSC 1134 | Network+ | 3 |
| CTSC 1651 | Cisco Router Technology | 3 |
| CTSC 2120 | Network Security Fundamentals | 3 |
| CTSC 2314 | Network Defense and Countermeasures-Hardening the Infrastructure | 3 |
| CTSC 2652 | Cisco Advanced Router Technology | 3 |

# Learning Outcomes

1. Apply techniques and tools to visualize data in order to explore trends and patterns.
   - *Core Ability Supported: Process Information*
2. Apply techniques to clean data that is incomplete or missing.
   - *Core Ability Supported: Process Information*
3. Demonstrate the ability to build a decision tree.
   - *Core Ability Supported: Think Critically and Solve Problems*
4. Demonstrate the ability to implement algorithms that use a linked-list based data structure.
   - *Core Ability Supported: Think Critically and Solve Problems*
5. Apply techniques for storage and retrieval of data to support the organization's functional units and external customers.
   - *Core Ability Supported: Process Information*

6. Demonstrate oral and presentation skills necessary to present data-driven results that tell a narrative applicable to the values and goals of the audience.
    - *Core Ability Supported: Communicate Effectively*