

ITMD 412 SYLLABUS

ITMD 412 Advanced Structured and Systems Programming

Hours: 3 credit hours / 45 contact hours

Instructor: Sheikh "Sam" Shamsuddin

Textbook, title, author, and year:

Starting Out with C++: From Control Structures to Objects, 9th Edition, by Tony Gaddis, 2017.

Specific course information

- a. Catalog description: Structured programming continues with advanced concepts including strings, arrays, pointers, data structures, file manipulation, and dynamic memory management. Students create more complex applications that work with user input, manipulate user supplied text or text obtained from a file, apply standard library routines for working with literal text, use pointers to store complex structures within arrays, and read and write data from files, the console, and the terminal. The object-oriented programming (OOP) paradigm is covered in depth including the philosophy of OOP, classes and objects, inheritance, template classes, and making use of class libraries. Current technologies included in this course include the C++ programming language.
- b. Prerequisites: ITM 312

Specific goals for the course

- a. Course Outcomes:
 - Implement Object Oriented Programming Methodology
 - Integrate language Standard Libraries in program design
 - Implement data structure and algorithms
 - Apply programming language Templates features
 - Improve program Design and Analysis
- b. Course Student Outcomes:

Upon successful completion of the course the student should be able to do the following:

 - Recall and apply Data Structure Algorithms such as Stack, Linked-List, Queues and Binary Trees
 - Create programs and apply the C++ Standard Template Library (STL)
 - Mine the language additional Standard Library
 - Analyze, evaluate and implement the reuse Programming Methodology
 - Distinguish between Object Oriented Programming and Structured Programming
 - Develop and enhance Object Oriented Programming skills

Topics to be covered

- a. C++ Review
- b. Advanced File IO
- c. Classes and Friends
- d. Operator Overload and Copy CON
- e. Inheritance
- f. Polymorphism and Virtual Function
- g. Function Template
- h. Error Exception
- i. STL
- j. Linked-list, STL list
- k. Stack, STL Stack
- l. STL dequeue, Queue Containers
- m. Recursive
- n. Binary Tree Searching