

1. *Course number and name*

CSC 340: Programming Methodology

2. *Credits and contact hours*

3 credits

Contact hours: 150 minutes of lecture sessions /week

3. *Instructor's or course coordinator's name*

Course coordinator: Hui Yang, Associate Professor of Computer Science

4. *Text book, title, author, and year*

C++ for Java Programmers (Paperback) by Mark Allen Weiss , Prentice Hall

other supplemental materials

Lecture Slides

5. *Specific course information*

a. *brief description of the content of the course (catalog description)*

This course explores advanced data structures and algorithms for manipulating them in C++. Emphasis is placed on design and implementation of those structures and a variety of practical applications. Algorithm coverage will include sorting and searching, and graph algorithms. Students will solve a series of problems to enhance their problem-solving skills.

b. *prerequisites or co-requisites*

grades of C or better in CSC 220, CSC230 and Math 227. Concurrent enrollment in CSC 412 is recommended.

c. *indicate whether a required, elective, or selected elective course in the program*

Required for Computer Engineering.

6. *Specific goals for the course*

a. *specific outcomes of instruction, ex. The student will be able to explain the significance of current research about a particular topic.*

At the end of this course students will

- Be able to write medium-sized C++ programs utilizing STL and an integrated development environment
- Determine which of the common sorting and searching algorithms to utilize for given problems
- Be able to apply and implement graph algorithms in practice

- b. *explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.*

Course addresses ABET Student Outcome(s): a, b, c, e, j, k.

7. *Brief list of topics to be covered*

- a. C++ Topics – transitioning from Java
STL, pointers, namespaces, inheritance, polymorphism, parameter passing, dynamic memory allocation
- b. Graph algorithms
Searching and sorting algorithms
- c. Sorting: quick sort, bubble sort, binary sort, mergesort, heapsort and insertion sort; runtimes of these algorithms will be considered.