

# Course Outline

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## 1. Document Information

<b>Degree Program</b>	Computer Science
<b>Course Number</b>	CS 304
<b>Course Title</b>	Advanced Object-Oriented Programming
<b>Semester Hours</b>	3
<b>Course Coordinator</b>	John Woods
<b>Revision Term</b>	Spring 2020
<b>Latest Revision</b>	Spring 2020

## 2. Catalog Description

Advanced features of object-oriented programming are covered in depth. The topics covered include, but are not limited to, the following: polymorphism, inheritance, overloading, generic programming, exception handling, file I/O, GUI development. A group project is an integral part of the course.

## 3. Textbooks

- Horstmann, C. & Budd, T. (2017). Big C++, John Wiley & Sons, 3rd Edition. Print ISBN: 9781119635727; e-book 9781119402978

## 4. References

- Forouzan, B.A. & Gilberg, R.F. (2020). C++ Programming: An Object-Oriented Approach, McGraw-Hill Education. ISBN: 978-1259571459.

## 5. Course Learning Outcomes

- To learn object-oriented programming in C++.
- To learn some advanced program design techniques.
- To learn some advanced programming techniques.
- To improve one's ability to program sophisticated solutions to difficult problems

## 6. Assessment of the Contribution to Student Outcomes

Outcome	1	2	3	4	5	6
Assessed	X	X	X		X	X

## 7. Prerequisites by Topic

CS 220 with a grade of C or better.

## 8. Major Topics Covered in the Course

1. Major differences between Java and C/C++: Boolean data type; unsigned numeric; data types; assignment expressions; interpretation of logical true and false; arrays, C-style strings (null terminated strings); definition of classes; input/output; preprocessor directives; storage classes; scope rules; struct and union; enumerations; pointers ; memory management (new and delete); references; typedef; const keyword; default arguments; friends (functions and classes); name spaces; multiple inheritance {9 classes}
2. Polymorphism: virtual functions; types of inheritance {3 classes}
3. Operator overloading: characters (ctype library); C-style strings (cstring library); the string class {6 classes}
4. Character and string processing: characters (ctype library), C-style strings (cstring library); the string class {3 classes}
5. Templates: template functions; the standard template library; containers; iterators; generic algorithms {5 classes}
6. Exception handling: try, throw, and catch; examples {2 classes}
7. File processing: sequential files (creating, reading, updating); random access files (creating, writing randomly, reading randomly, reading sequentially) {3 classes}
8. GUI development with MFC: introduction to the Microsoft Foundation Classes; event-driven programming; building GUI applications {9 classes}