

<b>Dept Number</b>	<b>CS 304</b>	<b>Course Title</b>	<b>Advanced Object-Oriented Programming</b>							
<b>Semester Hours</b>	<b>3</b>	<b>Course Coordinator</b>	<b>Justin Selgrad</b>							
		SP15								
<b>Catalog Description</b>	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.									
<b>Textbooks</b>										
<i>Big C++</i> , Horstmann, Cay and Timothy Budd. John Wiley & Sons, 2 <sup>nd</sup> Edition, 2009. ISBN: 9780470383285.										
<b>References</b>										
<ul style="list-style-type: none"> <li>• <i>Absolute C++</i>, Savitch, Walter Addison Wesley, 2002.</li> <li>• <i>Standard C++</i>, Wang, Paul S., Addison Wesley, 2001.</li> <li>• <i>Visual C++.NET How to Program</i>, Deitel, ET. Al., Prentice Hall, 2004.</li> </ul>										
<b>Course Learning Outcomes</b>										
<ul style="list-style-type: none"> <li>• To learn object oriented-programming in C++.</li> <li>• To learn some advanced program design techniques.</li> <li>• To learn some advanced programming techniques.</li> <li>• To improve one's ability to program sophisticated solutions to difficult problems.</li> </ul>										
<b>Assessment of the Contribution to Student Outcomes</b>										
<b>Outcome →</b>	1	2	3	4	5	6	7	8	9	10
<b>Assessed →</b>	X	X	X	X	X	X		X		
<b>Prerequisites by Topic</b>										
CS 220 with a grade of C or better.										

**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}