

<b>Course 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>John Woods</b>			
		SP20				
<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>						
Horstmann, C. & Budd, T. (2017). <i>Big C++</i> , John Wiley & Sons, 3 <sup>rd</sup> Edition. Print ISBN: 9781119635727; e-book 9781119402978.						
<b>References</b>						
FA20						
Forouzan, B.A. & Gilberg, R.F. (2020). <i>C++ Programming: An Object-Oriented Approach</i> , McGraw-Hill Education. ISBN: 978-1259571459.						
<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
<b>Assessed →</b>	X	X	X		X	X
<b>Prerequisites by Topic</b>						
CS 220 with a grade of C or better.						

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<b>Major Topics Covered in the Course</b>		
<ol style="list-style-type: none"> <li>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 }</li> <li>2. Polymorphism: virtual functions; types of inheritance {3 classes }</li> <li>3. Operator overloading: characters (ctype library); C-style strings (cstring library); the string class {6 classes }</li> <li>4. Character and string processing: characters (ctype library), C-style strings (cstring library); the string class {3 classes }</li> <li>5. Templates: template functions; the standard template library; containers; iterators; generic algorithms {5 classes }</li> <li>6. Exception handling: try, throw, and catch; examples {2 classes }</li> <li>7. File processing: sequential files (creating, reading, updating); random access files (creating, writing randomly, reading randomly, reading sequentially) {3 classes }</li> <li>8. GUI development with MFC: introduction to the Microsoft Foundation Classes; event-driven programming; building GUI applications {9 classes }</li> </ol>		