USC	Professional C++			
Viterhi	ITP 435x (3 Units)			
School of Engineering	Fall 2016			
School of Engineering				
Objective	This course provides students with the advanced knowledge they will need to			
	succeed as a professional C++ developer. By semester's end, students will:			
	 Become familiar with advanced C++ language idioms. 			
	2. Gain exposure to common libraries used professionally today.			
Concente	3. Understand now to write efficient and nigh-quality C++ code.			
Concepts	Code Generation. Memory layout. Templates. STL. Optimization. Exceptions. RTTL.			
	Design Patterns. Metaprogramming. Lambda Expressions. Boost. Custom Memory			
Droroquisitos	Allocators. C++11. Compliers.			
Instructor	CSCI 104 OF TIP 365X			
Contact	Sanjay Madnav			
Contact	Any questions related to the course and material should be posted on Plazza.			
Office Hours	M/W 4:20-7DM in OHE 520H			
Graders/TAs				
	Tuesday and Thursday, 12:30 – 1:50PM in KAP 160			
Course Structure	The tonics covered during class meetings will be applied to the seven programming			
	assignments spread out through the semester. All programming assignments must			
	be completed <i>individually</i> .			
	Fall 2016's programming assignments will be:			
	1. RLE Compression/Decompression			
	2. Password Cracker			
	3. ProPaint			
	4. DNA Amino Acid Histogram + Sequence Alignment			
	5. Zombie Apocalypse Simulator			
	6. Zombie-C Compiler			
	7. Travelling Trojan			
	There are two exams that are comprehensive of all tonics covered			
Textbooks	Required:			
	Effective C++ (Third Edition). Scott Meyers. ISBN-10: 0321334876.			
	Recommended:			
	Effective Modern C++. Scott Meyers. ISBN-10: 1491903996.			
Grading	The course is graded with the following weights:			
	Programming Assignments (7% each) 49%			
	Midterm Exam 21%			
	Final Exam 25%			
	Class Participation 5%			
	TOTAL POSSIBLE 100%			

Grading Scale	Letter grades will be assigned according to the following scale:				
	93%+	A			
	90-92%	A-			
	87-89%	B+			
	83-86%	В			
	80-82%	B-			
	77-79%	C+			
	73-76%	C			
	70-72%	C-			
	69	D+			
	67-68	D			
	66	D-			
	65 and below	F			
	Half porcontage	points will be rounded up to the payt whole perceptage. So for			
	Hall percentage points will be rounded up to the next whole percentage. So for				
	Instance, 89.576				
	There is no curving. Students will receive the grade they earn. Extra credit is				
	generally not offered.				
Policies	Make-up policy for exams: To make up for a missed exam, the student must provide				
	a satisfactory reason (as determined by the instructor) along with proper				
	documentation. Make-up exams are only allowed under extraordinary				
	circumstances.				
	Late Assignments: Late assignments will be accepted one day late for a 15% penalty				
	and two days late for a 30% penalty. An assignment submitted later than this will				
	be given a grade of 0, unless there is an extraordinary and documented reason as to				
	why it was late.				
	Students will be able to setup their own PC or Mac for use in the class, as all				
	software is free either in general or specifically for students enrolled in Viterbi				
	courses. All pro	jects natively build on both PC and Mac, assuming the appropriate			
	software is insta	alled. Linux should work as well, but no technical support will be			
	provided for stu	idents who wish to use Linux.			
	Alternatively, II	P offers Open Lab use for all students enrolled in ITP classes. These			
	open labs are neid beginning the second week of classes through the last week of				
	classes. Please contact your instructor for specific times and days for the current				
	semester.				

Statement on	Academic Conduct			
Academic Conduct	Plagiarism – presenting someone else's ideas as your own, either verbatim or recast			
and Support	in your own words – is a serious academic offense with serious consequences.			
Systems	Please familiarize yourself with the discussion of plagiarism in SCampus in Section			
	11, Behavior Violating University Standards https://scampus.usc.edu/1100-			
	behavior-violating-university-standards-and-appropriate-sanctions/. Other forms o			
	academic dishonesty are equally unacceptable. See additional information in			
	SCampus and university policies on scientific misconduct,			
	http://policy.usc.edu/scientific-misconduct/.			
	Discrimination, sexual assault, and harassment are not tolerated by the university.			
	You are encouraged to report any incidents to the <i>Office of Equity and Diversity</i>			
	http://equity.usc.edu/ or to the Department of Public Safety			
	http://capsnet.usc.edu/department/department-public-safety/online-			
	forms/contact-us. This is important for the safety whole USC community. Another			
	member of the university community – such as a friend, classmate, advisor, or			
	faculty member – can help initiate the report, or can initiate the report on behalf of			
	another person. The Center for Women and Men http://www.usc.edu/student-			
	affairs/cwm/ provides 24/7 confidential support, and the sexual assault resource			
	center webpage <u>sarc.usc.edu</u> describes reporting options and other resources.			
	Sunnort Systems			
	A number of USC's schools provide support for students who need help with			
	scholarly writing. Check with your advisor or program staff to find out more			
	Students whose primary language is not English should check with the American			
	Language Institute http://dornsife.usc.edu/ali, which sponsors courses and			
	workshops specifically for international graduate students. The Office of Disability			
	Services and Programs			
	http://sait.usc.edu/academicsupport/centerprograms/dsp/home_index.html			
	provides certification for students with disabilities and helps arrange the relevant			
	accommodations. If an officially declared emergency makes travel to campus			
	infeasible, USC Emergency Information <u>http://emergency.usc.edu/</u> will provide			
	safety and other updates, including ways in which instruction will be continued by			
	means of blackboard, teleconferencing, and other technology.			
A Further Note on	In this class, all programming assignment submissions will be compared with			
Plagiarism	arism current, previous, and future students' submissions using MOSS, which is a code			
	plagiarism identification program. If your code significantly matches another			
	student's submission, you will be reported to SJACS with the recommended penalty			
	of an F in the course.			
	It is about a discuss solutions to specific problems with other students, but it is not			
	It is okay to discuss solutions to specific problems with other students, but it is not			
	online or from a student you know it is cheating. Do not share your code with			
	anyone else in this or a future section of the course, as allowing someone else to			
	conviour code carries the same negative as you conving the code yourself			
	copy your code carries the same penalty as you copying the code yoursell.			

	Course Outline					
W	Date	Topic(s)	Reading/PA			
1	8/23	Introduction; Big-O and Performance				
	8/25	Assorted Topics; Test-Driven Development	<i>Effective</i> : Intro & #1-4; 7; 9-12; 20, 27			
2	8/30	Sizeof; Virtual tables	<i>Effective</i> : #5, 6, 26, 30			
	9/1	Basic Parallel Programming; Intel TBB				
3	0/0	Is-a vs. Has-a; Preprocesser	PA1 Due 9/7 @ 11:59PM			
	9/0		Effective: #32-40			
	9/8	Design Patterns				
4	9/13	Smart Pointers	Modern: #18-21			
	9/15	Move Semantics	Modern: #23-26			
5	9/20	Writing Optimized and Secure Code	PA2 Due 9/21 @ 11:59PM			
	9/20	Writing Optimized and Secure Code	Effective: #30-31			
	9/22	Uniform Initializers; Initializer Lists	Modern: #7			
G	9/27	Exceptions and RTTI				
0	9/29	Template Metaprogramming				
	10/4	DNA/Bioinformatics; Dynamic	PA3 Due 10/5 @ 11:59PM			
7	10/4	Programming				
	10/6	Guest Lecture				
0	10/11	Midterm Review				
0	10/13	<u>Midterm exam</u>				
	10/18	Custom Memory Allocators	PA4 Due 10/19 @ 11:59PM			
9		, , , , , , , , , , , , , , , , , , ,	Effective: #49-52			
	10/20	Intro. to Compilers – Basics; Lexical Analysis				
10	10/25	Intro. to Compilers – Syntax Analysis				
	10/27	Guest Lecture				
	11/1	Intro. to Compilers – Code Generation				
11	11/3	Boost Library: C++11 Concurrency: Testing	Modern: #25; Effective: #55			
	,		PA5 Due 11/4 @ 11:59PM			
12	11/8	A Deep Dive into "auto"				
	11/10	TBD				
13	11/15	Lambdas/Functional Programming	Modern: #2, 5, 6			
	11/17	Genetic Algorithms	PA6 Due 11/18 @ 11:59PM			
14	11/22	C++1z and Beyond				
	11/24	No class – Thanksgiving				
15	11/19	Selected Talks from cppcon2016				
	12/1	Final Review	PA7 Due 12/2 @ 11:59PM			
		Final Exam – Tuesday, December 13 @ 11-1	PM_			

Note that "Effective" refers to *Effective C++* while "Modern" refers to *Effective Modern C++*.