



enum class (cont.)	illustrative example, 355–359
use cases (cont.)	o files, effect on, 359–365.
namespace pollution, avoiding, 339–340	potential pitfalls, 371–373
overloading disambiguation, 340–343	corresponding explicit-instantiation
weakly typed C++03 enumerators, draw-	declarations and definitions, 371–372
backs to, 333–335	pessimization over optimization, 373
enumerations. See also opaque enumerations	use cases, 365–370
comparisons in $C++20$ , $335n1$	insulation from client code, 369–370
underlying types (UTs)	reducing code bloat in object files, 365–
description of, 829–830	369
further reading for, 834	explicit instantiation definitions, 353–355, 358–359,
potential pitfalls, 832–833	= : : : : : : : : : : : : : : : : : : :
use cases, 830–832	363, 370–375
enumerators, as compile-time constants, 164	explicit instantiation directives, 353n1, 354–355,
errors	369, 375
compiler warnings as, 150	explicit template argument specifications, 895
	explicit typenames, 26–27
compile-time, 22	explicitly captured, 582–583
escalation, 374	explicitly copied, 583
essential behavior, 102	explicitly declaring special member functions, 33–
event-driven callbacks, 603–604	34
exception agnostic, 644, 1126	exporting bitwise copies of PODs, 479–480
exception-free path, 1134, 1136, 1143	expression alias, 1146–1147
exception safe, 644, 1126	expression SFINAE, 29n3, 122, 126
exception specifications, 593. See also noexcept	expression templates, 202–203
exception specifications	expressions. See also lambda expressions
conditional, 1091–1092	compound, noexcept operator and, 626–627
constraints in class hierarchies, 655–658	decltype use with, 25–26
dynamic, 618–619	decomposing complex, 391–393
function types and, 1147–1148	rvalue references in, 730–731
text-segment size comparison, 1108	
type system and, 1089n5	validation of, 28–30
unconditional, 1085–1089	extended alignment, 168–170
violating, 1093	extended friend declarations. See friend decla-
exceptions, 615–618, 1104	rations
excess $N$ notation, 155	extended typedef. See aliases
executable images, 1135	extern template
execution character sets, 844	annoyances, 373–375
expansion. See pack expansion	member validity, 374–375
expiring objects, 741–742, 749	unrelated class definitions, 373–374
expiring value	description of, 353–365
rvalue references, 712–713	further reading for, 376
xvalues, 721-723	illustrative example, 355–359
explicit class APIs, 38–39	o files, effect on, 359–365
explicit constructors, passing multiple arguments,	potential pitfalls, 371–373
250–252	corresponding explicit-instantiation
	declarations and definitions, 371–372
explicit conversion operators	pessimization over optimization, 373
description of, 61–63	
potential pitfalls, 66–67	use cases, 365–370
use cases, 63–65	insulation from client code, 369–370
explicit instantiation declarations	reducing code bloat in object files, 365–
annoyances, 373–375	369
member validity, 374–375	external definitions for static member variables,
unrelated class definitions, 373–374	314–315
description of, 353–365	external linkages, 307
further reading for, 376	external static analysis, control of, 17–18