

## Video Lectures

Numerous video lectures are available on topics related to the course materials. A list of these video lectures is given below. The video lectures focus primarily on the C++ programming language, the C++ standard library, and a variety of software development tools. Students may find some of these video lectures to be helpful at various points in the course. In particular, the video lectures are expected to be extremely helpful to students who have no (or very limited) prior experience with C++ and need to quickly get up to speed with this language. **Note that the vast majority of topics covered in the course are not covered by these video lectures. So, it is critically important that students attend in-class lectures and not attempt to rely solely on the video lectures for learning the course materials.**

1. Software Development Tools [104.02 mins  $\approx$  1.73 hours]
  - (a) Getting Started [13.31 mins  $\approx$  0.22 hours]
    - i. C++ Compiler and Linker [Duration: 13:19]  
<https://youtu.be/w5s7XgnLHoo>
  - (b) Version Control Systems [37.40 mins  $\approx$  0.62 hours]
    - i. Version Control Systems [Duration: 06:50]  
[https://youtu.be/9s9\\_DLH1jaY](https://youtu.be/9s9_DLH1jaY)
    - ii. Git Introduction [Duration: 17:24]  
[https://youtu.be/scm2kxsX\\_Rk](https://youtu.be/scm2kxsX_Rk)
    - iii. Git Demonstration [Duration: 13:10]  
<https://youtu.be/8VHC7vzWihw>
  - (c) Build Tools [53.31 + 27:55 mins  $\approx$  0.88 + 0.5 hours]
    - i. Build Tools [Duration: 03:24]  
[https://youtu.be/FPcK\\_swg-f8](https://youtu.be/FPcK_swg-f8)
    - ii. Make Introduction [Duration: 27:55]  
[https://youtu.be/FsGAM2pXP\\_Y](https://youtu.be/FsGAM2pXP_Y)
    - iii. CMake Introduction [Duration: 22:13]  
<https://youtu.be/Ak6cGZshduY>
    - iv. CMake Examples [Duration: 27:42]  
<https://youtu.be/cDWOECgupDg>
2. Basics [202.5 mins  $\approx$  3.37 hours]
  - (a) Introduction [Duration: 06:06]  
<https://youtu.be/mP1wuVWKQmg>
  - (b) Objects, Types, and Values [Duration: 1:09:06]  
<https://youtu.be/FlbBgg5IamY>
  - (c) Operators and Expressions [Duration: 22:10]  
<https://youtu.be/hwI4IHEUMZs>
  - (d) Control-Flow Constructs [Duration: 23:19]  
[https://youtu.be/kEKy\\_TwNbEE](https://youtu.be/kEKy_TwNbEE)
  - (e) Functions [Duration: 1:00:57]  
<https://youtu.be/NHS1726zvmE>
  - (f) Input/Output (I/O) [Duration: 12:41]  
<https://youtu.be/MFSA1-ld2Bc>
  - (g) Miscellany [Duration: 08:12]  
<https://youtu.be/IcPgHnmWy-8>
3. Classes [143.5 mins  $\approx$  2.39 hours]
  - (a) Introduction [Duration: 02:09]  
<https://youtu.be/8XIdrmAS4Aw>
  - (b) Members and Access Specifiers [Duration: 35:13]  
<https://youtu.be/ZdtqC6zASEI>
  - (c) Constructors and Destructors [Duration: 30:27]  
<https://youtu.be/9NVA6AGtccc>

- (d) Operator Overloading [Duration: 41:05]  
<https://youtu.be/kpIJzSEIe4Y>
- (e) More on Classes [Duration: 12:25]  
<https://youtu.be/esPOG-FQhdc>
- (f) Temporary Objects [Duration: 14:01]  
<https://youtu.be/TT0TcIUo88E>
- (g) Functors [Duration: 08:14]  
[https://youtu.be/qM2kvcSW4\\_E](https://youtu.be/qM2kvcSW4_E)
- 4. Templates [55.01 mins  $\approx$  0.91 hours]
  - (a) Introduction [Duration: 01:24]  
<https://youtu.be/q9Wx-kB7MRw>
  - (b) Function Templates [Duration: 25:48]  
<https://youtu.be/hD9MN9aVfi4>
  - (c) Class Templates [Duration: 18:56]  
<https://youtu.be/NXUR5tftHtE>
  - (d) Variable Templates [Duration: 04:03]  
<https://youtu.be/tble6t8uFGk>
  - (e) Alias Templates [Duration: 04:50]  
<https://youtu.be/mzM0MHQIQcI>
- 5. Standard Library [97.1 mins  $\approx$  1.61 hours]
  - (a) Introduction [Duration: 10:15]  
[https://youtu.be/-TY7\\_GniLig](https://youtu.be/-TY7_GniLig)
  - (b) Containers, Iterators, and Algorithms [Duration: 38:57]  
<https://youtu.be/TxufBysSPK0>
  - (c) The vector Class Template [Duration: 27:43]  
<https://youtu.be/T8uaiYTIwjc>
  - (d) The basic\_string Class Template [Duration: 15:15]  
<https://youtu.be/J6POJIHactU>
  - (e) Time Measurement [Duration: 04:58]  
<https://youtu.be/UeCiNGRZAyA>
- 6. Concurrency [246.3 mins  $\approx$  4.10 hours]
  - (a) Preliminaries [Duration: 1:01:49]  
<http://youtu.be/oM1VxfrTQWg>
  - (b) Threads [Duration: 33:44]  
<http://youtu.be/fqG8BgVbmcM>
  - (c) Mutexes [Duration: 1:25:24]  
<http://youtu.be/Vm-Jsno58Y0>
  - (d) Condition Variables [Duration: 17:37]  
<http://youtu.be/Wsk56vrK0ng>
  - (e) Promises and Futures [Duration: 47:44]  
[http://youtu.be/hic5W\\_UMjqU](http://youtu.be/hic5W_UMjqU)
- 7. Computational Geometry Algorithms Library (CGAL) [79.36 mins  $\approx$  1.32 hours]
  - (a) Introduction [Duration: 08:04]  
[https://youtu.be/Mk-NH2-\\_hMo](https://youtu.be/Mk-NH2-_hMo)
  - (b) Polygon Meshes [Duration: 33:53]  
<https://youtu.be/R8hlJCR4x00>
  - (c) Surface Subdivision Methods [Duration: 03:22]  
[https://youtu.be/t\\_zvp9dTTBY](https://youtu.be/t_zvp9dTTBY)
  - (d) Example Programs for Polygon Meshes [Duration: 34:03]  
<https://youtu.be/sTfG7tStFvI>