Reading Number is shown for the reading paper that is due on that date. E.g. Paper No. 1 is due at beginning of class on Sep 5. Readings Source: **K&R**: Kernighan & Ritchie, **S**: Stroustrup, **H**: Handout on course website (*assigned handouts must be covered in your paper*). Your paper must discuss each chapter, section, or handout listed; cover the entire chapter or section unless part of it is listed as "skip." A section assigned as "skim" requires only a brief (e.g. one sentence) mention in your paper. Topics discussed in lecture will often overflow into the next class period, but reading assignments are still due on the scheduled date.

Date		No,	Lecture topics, reading assignments, and projects
Sep	3 T		**Organizational and Introduction.**
Sep	5 Th	1	**C concepts: prototypes, headers, linkage; C++ streams for Project 0**

• K&R 1-4. Much will be familiar but watch for new information, especially in Ch. 4; notice the differences from previous C++ coverage.
• H: *Header File Guidelines for C Programs* (see above about handouts)
• H: *Notes on Basic C++ Stream I/O.* Needed for Project 0 since previous courses have not covered streams adequately.
• H: *Using C++ File Streams.* Needed for Project 0 since previous courses have not covered streams adequately.

| Sep | 10 T | 2 | **Pointers, Arrays, Function pointers, structures.** |

• K&R 5. Read carefully about pointers, arrays, function pointers; skim 5.12 about complex declarations; K&R 6-6.4; skim 6.5-6.9

Sep	12 Th		**Pointers, etc, continued.** No new reading assignment, but if possible, read ahead in K&R 7.8.5 about malloc/free
Sep	**13 F**		***** Project 0 Due**
Sep	17 T	3	**I/O, Type safety, memory allocation.**

• Read K&R 7 on I/O and other functions, then pay special attention to the highlights presented in the handout:
• H: *A Summary of Stream I/O in C*
End of C material - everything needed for Project 1 has been presented - start it now, if you haven't already!

| Sep | 19 Th | 4 | **C++ review and preview. Lots to read, but this is a review of familiar things and a preview of later new material, so bear with it.** |

Throughout Stroustrup, take time to think about his "advice" sections at the end of each chapter - extremely valuable.
• Stroustrup: All four prefaces, Ch. 1. Then read "Tour" chapters 2, 3, 4 and 5 but skip 5.3 Concurrency, and skim rest.
• H: *Using using.*

| *Sep* | *23 M* | | ****** Last day to drop without a "W"*** |
| Sep | 24 T | 5 | **Basic facilities. Much should be familiar, but watch for new techniques!** |

• S 6. Look for C++11 concepts.
• S 7 but skim 7.3.2.1 raw string literals, skim 7.3.2.2 unicode topics, slow down and read carefully 7.7 on rvalue reference.
• S 8 skip 8.2.4, skim 8.2.6 on POD, skim 8.2.7 Fields, skim 8.3 Unions introduction, then skip 8.3.1 and 8.3.2.
• S 9. should be very familiar.
• S 10 but skim 10.2 calculator example - read for concepts involved, not details.
• S 11 Skip 11.2.4 on overloading new. Skim 11.3 "Lists" are C++11's initialization lists. Skip 11.4 Lambda Expressions - we'll come back.
• S 12 Functions. Skip 12.2.3 List Arguments; skip 12.2.4 Unspecified number of arguments. Skip 12.5 and 12.6 - redundant with C coverage.

| Sep | 26 Th | 6 | **Exceptions, Classes, objects with dynamic memory contents, the "Rule of Five"** |

Optional - S 14 and 15 are redundant with C coverage and earlier handouts - skim them if you want another view of these topics.
• S 13 Exception Handling. Skip 13.3.1, skim 13.4, 13.5.2.4, 13.5.2.5, skip 13.5.3, 13.6.
• S 16 Classes, skip 16.2.9.4.
• H: *Incomplete Declarations*
• H: *C++ Header File Guidelines*
• H: *Static Members*
• S 17 Construction, Cleanup, Copy, Move. Skip inheritance-related and initializer-list sections 17.2.3, 17.2.5, 17.3.4, 17.4.2, 17.5.1.2, 17.5.1.4

| **Sep** | **27 F** | | ***** Project 1 Due** |
| Oct | 1   T | 7 | **Operator Overloading, Basic Templates.** |

• H: *A Summary of Operator Overloading*, then read • S 18 and • S 19. Skip 19.2.5, 19.2.6. Skim 19.3.
• S 23 Templates. Skim 23.5.2, skip 23.5.2.1, 23.5.2.2, 23.7.1

Oct 3 Th 8 **Standard Library Containers, Strings, Streams.**
  • S 30. An overview of the library. Learn to read this stuff without getting bogged down in the details. Skip 30.3.1, 30.4.1.2 and 30.4.1.3, and all of 30.4.3.
  • S 31. Note public interfaces described in compact tables. Use these for reference; read for the concepts. Skim 31.4.3.2 on unordered containers.
  • S 34 on "almost containers" read 34.1 and 34.2 but skip 34.2.2 bitset and 34.2.3 vector<bool>; skim 34.2.4.2 tuple. Skip rest chapter for now.
  • S 36 Strings. Skim this complete presentation of an extremely important and elaborate class; plan to look up as needed, follow his examples.
  • S 38 Streams. Skim, but if confused, re-read the streams Handouts assigned earlier. Skip 38.5 for now, then skip 38.6 on buffering.

Oct 8 T 9 **Algorithms, Iterators, Function Objects, Lambda, std::bind, pointers to member functions**
  • S 32 STL Algorithms. Skim 32.2.1
  • S 33 Iterators. Skip 33.1.3. Go back and read 38.5 on stream iterators.
  • S 20.6 Pointers-to-members - this little topic is out of place there, so read it now, but skim 20.6.2, skip 20.6.3.
  • H: *Heterogenous Lookup in the STL: We Don't Need Probe Objects!*
  • H: *Fill'er Up: Winners and Losers for Filling an Ordered Container*
  • Read • H: *Using C++11's Lambdas* then return to an earlier chapter and read • S 11.4 Lambda Expressions
  • H: *Using C++11's bind with Containers and Algorithms*

Oct 10 Th **Basic Class Design.** No reading assignment, but bring H: *Basic Class Design* to lecture to mark up

Oct 11 F ***** Project 2 Due**

Oct 15 T *Fall Break - no classes*

Oct 17 Th **Project 1 Code Review**

Oct 22 T **Midterm Exam: 3:00-5:00 PM, Room(s) TBA, Date is tentative and may need to be changed depending on room availability.**

Oct 24 Th *No Class - catch-up for Project 3 — Kieras will hold extended office hours during class time.*

Oct 25 F ***** Project 3 Due**

Oct 29 T 10 **Simple forms of inheritance and polymorphism: Inheritance & Virtual Functions**
  • S 20 Derived Classes. Skim 20.3.5, 20.3.5.1, 20.3.6, 20.5.3. We already read 20.6, so skip it this time.

Oct 31 Th **Using Virtual Functions and Introduction to OO Design.** Lecture: Project 4 design overview. No reading assignment is due, but bring to lecture:
  A hard copy of H: *Introduction to UML,* and H: *Basic OOP Concepts* (BasicOOPConcepts-HO.pdf) or the lecture notes on Basic OOP Concepts.

Nov 5 T 11 **More on Inheritance and Virtual Functions; Exceptions and memory management, RAII, "smart pointers"**
  Read H: *C++11's Smart Pointers* then read • S 34.Memory and Resources, read 34.3, then Advice 34.7, Skip the rest of the chapter.

Nov 6 W ***** *Last day for drop as "W" without petitioning***

Nov 7 Th **Some Idioms and Design Patterns** (no reading assignment - bring hardcopies of Lecture Notes: IdiomsDesPattsX.pdfs to mark up)

Nov 8 F ***** Project 4 Due**

Nov 12 T 12 **Multiple inheritance and run-time type identification.**
  • S 21. Class Hierarchies. Skim the convoluted example in section 21.1 and 21.2. Skip 21.3.6.
  • S 22. Run-time Type Identification. Skip 22.2.4., 22.5.1, Skip 22.3.

Nov 14 Th **More Idioms and Design Patterns** (no reading assignment - bring hardcopies of Lecture Notes: IdiomsDesPattsX.pdfs to mark up)
  TBA below: Either scheduled lecture topic(s) or Kieras holding additional office hours during class time.

Nov 19 T **TBA:More Idioms and Design Patterns**

Nov 21 Th **TBA:More Idioms and Design Patterns, Non-technical Issues in Software Development (**No reading assignment)

Nov 22 F ***** Project 5 Due**

Nov 26 T *No class meeting - Extended office hours held in Kieras's office.*

Nov 28 Th *Thanksgiving Break - no classes*

Dec 3 T *No class meeting - Extended office hours held in Kieras's office.*

Dec 5 Th *No class meeting - Extended office hours held in Kieras's office.*

Dec 10 T ***** Project 6 Due - time and place for submission of hard copy materials to be announced. (No class meeting, no office hours.)**

Dec 13 F **FINAL EXAM, 10:30 AM - 12:30 PM Room TBA.**