Note: There are 3 different versions of the exam. These topics represent the coverage of all 3 exams combined (i.e. you will not have 15 questions that require you to write code).

Written questions about:
1. const class member functions
2. constructors
3. copy constructor
4. deep & shallow copy
5. default function parameters
6. destructors
7. duality of arrays and pointers
8. friend functions
9. function overloading
10. include guards
11. information hiding
12. inheritance and composition
13. memory allocation, deletion, and dangling pointers
14. principles of object oriented programming
15. public/private/protected in the context of class inheritance
16. public/private/protected in the context of class members
17. pure virtual functions and abstract classes
18. this
19. virtual functions and static & dynamic binding

Questions that require you to write code (size in parentheses).
Note, The primary focus of the question is listed. If the size of the code is an entire class then you may also need to understand other things. For example, if you have to write a class about copy constructors, you will also need to understand public/private/protected.
1. dangling pointers (code segment)
2. deep & shallow copy (code segment)
3. duality of arrays and pointers (code segment)
4. include guards (code segment)
5. pure virtual functions (code segment)
6. this (code segment)
7. virtual functions (code segment)
8. copy constructor (function)
9. abstract class (class)
10. 2d dynamic arrays (class)
11. chaining the dot operator (class)
12. composition (class)
13. inheritance (class)
14. operator overloading using a class member function (class)
15. operator overloading using a friend function (class)

See following page for test day instructions
**Midterm details:**

- If you are in the Th 5:30 PM class but are attending the Th 4:00 class, you must take the Th 4:00 midterm.
- Do not forget to turn in your printed copy of the assignment at the start of class (i.e. before the exam is handed out), otherwise it will be considered late.
- Towards the beginning of the exam a sign-in sheet will be passed around. Please write your name and also sign your name.
- You are not permitted to use any book, notes, computer, phone, or calculator on the exam. Doing so is an automatic 0.
- You will be given a 5 minute warning and a 1 minute warning before the exam is over.
- You are not permitted to write on the exam paper after time is up.
- You are not permitted to exit the room or use the bathroom during the exam. Doing so means you are finished with the test and you will not be allowed to start again. If necessary, please bring a medical notice or copy of one to class (it will be kept and returned after the exam is graded).

*This bullet point does not apply to DRC students.*

- Use pencil, not pen.
- Do not separate pages or remove the staples.
- Fit answers in the space provided
- Do not put answers in the margins or on the back of pages.
- You may use the back of pages for scratch work, but none of it will be graded.
- The 19th question is a longer question that represents a considerable portion of the grade. Do not get bogged down by difficulties in earlier questions such that you do not have time to answer this question.
- If you finish early you may turn in your exam and leave, but it is highly advised to use the allotted time to double check your work.