



Department of Electrical and Computer Engineering
Faculty of Engineering and Applied Science

ENGI1000: Exam Writing
Final exam
41 Jan 2090

Name: _____
Student ID: _____

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Final exam

Question	Points	Score
1	4	
2	4	
3	3	
4	2	
5	0	
Total:	13	

Instructions

1. This is a closed-book exam: written aids are not permitted.
2. Calculators, phones and all other electronic aids are forbidden.

In which questions varied and sundry are asked

1. Explain the differences between: [4]

(a) Pointers vs references [2]

Solution: A pointer is a number, a location in memory, so it must be *dereferenced* to access a value. A reference can be treated just like the thing it references.

(b) `static_cast` vs `dynamic_cast` [2]

Solution: The compiler has all information required to do a `static_cast` at compiler time, whereas a `dynamic_cast` requires run-time information.

2. Define the following terms. [4]

(a) Expression [2]

Solution: Something that can be evaluated

(b) Abstract class [2]

Solution: A class with at least one unimplemented method

In which the student is subjected to further examination

3. What is the correct C++ syntax for: [3]

(a) Declaring a move assignment operator within class Foo? [1]

- ☐ `operator = (Foo&);`
- ☐ `operator = (const Foo&);`
- ☒ `operator = (Foo&&);`
- ☐ `operator = (const Foo&&);`

(b) Creating a subclass of `class` Parent? [1]

- ☒ `class Child : public Parent {};`
- ☐ `class Child : override Parent {};`
- ☐ `class Child : subclass Parent {};`
- ☐ `class Child : virtual Parent {};`

(c) Defining a lambda function that increments an integer parameter? [1]

- ☐ `[]() { return x + 1; }`
- ☐ `[x]() { return x + 1; }`
- ☐ `[x](int x) { return x + 1; }`
- ☒ `[](int x) { return x + 1; }`

4. What is invalid about each of the following? How could you fix it? [2]

(a) Casting a `Car*` to a `Subaru*`: [2]

```
class Car { /* ... */ };
class Subaru : public Car { /* ... */ };
Car *car = /* ... */;
Subaru *s = car;
```

Solution: The Car might not be a Subaru. Use `dynamic_cast` to check.

Bonus questions

5. (a) What is the simplest possible lambda function?

1 (bonus)

Solution: `[](){}`